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MENINGOCOCCIC INFECTION IN SOLDIERS

LIEUTENANT COLONEL WORTH B. DANIELS
MEDICAL CORPS, ARMY OF THE UNITED STATES

CAPTAIN SYDNEY SOLOMON
MEDICAL CORPS, ARMY OF THE UNITED STATES

AND

FIRST LIEUTENANT WILLIAM A. JAQUETTE JR.
MEDICAL CORPS, ARMY OF THE UNITED STATES

One hundred and twelve patients with meningococcic infection were studied at the Station Hospital at Fort Bragg, North Carolina, between Jan. 1, 1942 and April 17, 1943. Eighty of these patients had meningitis, and 32 had bacteremia without localization in the meninges. Our purpose in the present communication is to describe certain observations in connection with meningococcic infections, particularly as they relate to pathogenesis and to present data on the efficiency of the treatment of this infection with sulfadiazine.

During 1942 at this post the disease occurred sporadically and there were only 16 cases in a large troop population. Beginning on Dec. 30, 1942 there was a decided increase in incidence. The weekly rate for the post as a whole reached 8 per thousand annually while the weekly rate for organizations composed of unseasoned troops went as high as 20 per thousand annually. Approximately one third of the soldiers at this post have had less than three months' service. This group furnished 59 per cent of all patients with meningococcic infection.

The rate for meningococcus carriers in troops during nonepidemic periods may range from 2 to 10 per cent.[1] In periods of epidemic the rate in healthy troops may reach 80 per cent.[2] The organism probably invades the body from the nasopharynx, and infection in this region may or may not be indicated by clinical disease. The subsequent manifestations are those of sepsis and localization. The present observations seem to confirm clearly the opinion of Herrick[3] and others that the course of events consists of an invasion of the blood stream and, if not prevented by spontaneous resistance or therapy, localization in the meninges, joints, skin, eyes or other body tissues. There is every reason to abandon the idea that meningitis is due to direct infection of the meninges through the cribriform plate except in those cases in which there is known trauma with fracture. It is essential to view this disease as a generalized sepsis that is sometimes overshadowed by the advent of the more dramatic symptoms of meningitis. It is highly important that the stage of sepsis be recognized early and that the patient be treated promptly, for in this way the disease can usually be terminated before localization in the meninges occurs. If meningitis does supervene in spite of early treatment, the advantages of prompt therapy have been afforded. The disease has been recognized in the stage of sepsis in 35 per cent of the cases in this series.

ANALYSIS OF CASES OF MENINGOCOCCEMIA

The diagnosis of meningococcemia without meningitis was made in 32 cases. These all occurred during the first four months of 1943 when there was increased incidence of meningococcic meningitis at this post. The onset of acute illness was usually preceded by vague complaints. In 78 per cent of the patients symptoms of disease of the respiratory tract were present for from twelve hours to fifteen days prior to diagnosis; the average period was six days. Feverishness was noted for an average of three days. Table 1 indicates the incidence of the important symptoms and findings in this group.

The incidence of headache was high. There were extremely few patients, however, in whom there was difficulty in distinguishing the intense bursting headache of meningitis from the much less severe one of meningococcemia. Nausea in 59 per cent of the patients emphasizes the fact that more patients with meningococcic infection have nausea and vomiting than persons suffering from other infections of equal severity. Rash is essential to a clinical diagnosis and was present in all our cases.

The blood leukocyte count ranged from 8,100 to 30,800 and averaged 17,000 per cubic millimeter. The blood culture was positive for meningococci in 56 per cent of the cases. Lumbar puncture was performed in every case in which meningitis was suspected, but in every case the spinal fluid was normal.

Meningococcic sepsis begins as a rule with prodromal symptoms of disease of the upper respiratory tract. After an indefinite period of from one to many days the manifestations become more acute. There is usually a sudden chill with rapid rise in temperature, but this may be gradual. Malaise, extreme weakness, aching of muscles, moderate headache, nausea, vomiting, pains in the joints or actual acute inflammation of joints develop. The most characteristic manifestation is the rash. Its presence is essential to clinical diagnosis prior to the advent of meningeal localization. The rash may be so sparse that careful and frequently repeated search is necessary to find it, or it may be obvious and noted by the patient. A wide variety of forms of rash occur, and knowledge of each variety is essential to the recognition of the disease. The commonest lesion in our experience is petechial or purpuric and varies from 1 to 15 mm.

From the Medical Service, Station Hospital, Fort Bragg, North Carolina.

1. Dingle, J. H., and Finland, Maxwell: Diagnosis, Treatment and Prevention of Meningococcic Meningitis, War Medicine **2**:1 (Jan.) 1942.

2. Cheever, F. S.: Sulfadiazine in the Treatment of Meningococcus Carriers, to be published.

3. Herrick, W. W.: Early Diagnosis and Intravenous Serum Treatment of Epidemic Cerebrospinal Meningitis, J. A. M. A. **71**:612 (Aug. 24) 1918.

in diameter. In addition to this type, which has been emphasized by most observers, other forms of rash, not commonly described, have been generally seen. Ill defined faint pink macules similar to the rose spots of typhoid are common. These may be quite evanescent, and not infrequently a scattered few may constitute the only cutaneous manifestation. Maculopapular lesions are usually present, and in a few instances they have a central petechia. The larger ones of this type are nodular or plaquelike and often tender. When on the extremities these nodules bear a striking resemblance to the smaller lesions of erythema nodosum. Any combination of the cutaneous manifestations may occur, and indeed most patients have shown more than one type of lesion. The petechiae occasionally are present in the conjunctivas and the oral mucous membranes. The rash may occur anywhere on the body but usually spares the face and is less common on the palms and soles. It may occur in crops. The macular lesions may recede with fall in temperature, only to reappear as the temperature again rises. The rapidity with which the rash may appear makes it necessary to examine carefully every suspected patient at hourly intervals. It may advance from a few vague spots to a widespread eruption in a few hours. The larger ecchymotic lesions have been noted to become vesicular, and in 1 instance ulceration occurred. The rapid disappearance of the maculopapular component of the rash within from twelve to eighteen hours after the beginning of sulfadiazine therapy is almost diagnostic.

Herpes simplex is common, usually occurring about the second day of the illness. Herpes zoster involving the ophthalmic and maxillary branches of the fifth cranial nerve occurred in 1 case.

The temperature on admission of these patients ranged from 97 to 105.6 F. It was generally between 101 and 102 F. Leukocytosis with an increase in polymorphonuclear cells was the rule, but in 4 cases (12 per cent) the leukocyte count was normal.

Table 4 summarizes the data on the cases of meningococcemia.

TABLE 1.—*Meningococcemia: Incidence of Symptoms and Findings in Thirty-Two Cases* *

Infection of Upper Respiratory Tract	Chill	Headache	Nausea or Vomiting	Pains in Joints	Rash
78	47	78	59	37	100

* The figures are percentages.

TABLE 2.—*Meningitis: Incidence of Symptoms and Signs in Eighty Cases* *

Infection of Upper Respiratory Tract	Headache	Nausea	Chill	Pains in Joints	Stupor	Stiff Neck	Kernig's Sign	Signs of Disturbance of Cranial Nerves	Rash †
56	99	91	51	24	44	99	95	10	83

* The figures are percentages.
† Of 16 sporadic cases 44 per cent, and of 64 epidemic cases 92 per cent, showed rash.

ANALYSIS OF CASES OF MENINGITIS

The prodromal symptoms of the soldiers in whom meningitis developed were similar to those of the patients with uncomplicated meningococcemia. Fifty-six per cent of the patients with meningitis had respiratory complaints for an average period of eleven days. Fever was present for three days prior to diagnosis. A shaking chill preceded the onset of meningitis by from three hours to fourteen days (average period thirty hours) in 36 per cent. This seems to be further evidence that sepsis is the initial phase in meningococcic meningitis. It was estimated that actual meningeal involvement existed for an average of one day before diagnosis. Table 2 shows the incidence of the important symptoms and signs in 80 cases of meningococcic meningitis.

The initial blood leukocyte count ranged from 10,500 to 43,500 with an average of 21,600 per cubic millimeter. The average spinal fluid leukocyte count was 6,800 with a range of from 0 to 23,000 per cubic millimeter.[4] There was no constant relation between the level of sugar in the spinal fluid and the severity of the disease, the spinal fluid cell count or the presence of meningococci on smear or culture. Meningococci were demonstrated on smear of the spinal fluid in 70 per cent of the cases and on culture in 81 per cent. The blood culture was positive in 40 per cent of the cases of meningitis.

In December of 1942, when it began to appear that there might be an epidemic of meningitis, an excellent system of coordination between the clinician and the laboratory was established. The bacteriologist was always notified before lumbar puncture was done, and spinal fluid for culture was taken at the bedside in warmed culture mediums. The increased efficiency of this and other special laboratory procedures is brought out in table 3.

TABLE 3.—*Laboratory Findings*

	Per Cent Positive with Good Laboratory Facilities (16 Cases)	Per Cent Positive with Special Laboratory Facilities (64 Cases)
Blood cultures	28	45
Spinal fluid cultures	52	93
Spinal fluid smears	47	73
Bacteriologic diagnoses	78	95

The increase in the proportion of positive bacteriologic diagnoses in the second group in table 3 cannot be entirely attributed to improvement in bacteriologic technic. There is another variable involved. Most of the cases in the first group occurred during the period when meningitis was sporadic, and those in the second group during the period of increased incidence of the disease. During periods of epidemic, cultures positive for meningococci are more commonly obtained. With this excellent laboratory [5] and clinical coordination during the period of increased incidence of meningococcic meningitis it was possible to achieve bacteriologic confirmation in 97.5 per cent of the patients who had not previously received any sulfonamide compound. It is equally significant that the meningococcus was not grown from the blood or the spinal fluid of any patient who had been treated with a sulfonamide compound prior to culturing. This was true in spite of the addition of paraaminobenzoic acid to the mediums.

Table 5 summarizes the findings in 80 cases of meningitis.

4. In 3 cases meningococci were found on culture of the spinal fluid at a time when the cell count was normal.

5. Lieut. Col. Frederick J. Pohle of the Medical Corps and the staff of the laboratory of the Station Hospital made such coordination possible.

Eight cases from this series have been selected for discussion because when considered together they indicate clearly that meningococcic meningitis begins as meningococcic bacteremia. The transition from the phase of sepsis to meningeal invasion is usually easy to recognize. However, cases are encountered in which there is no sharp line of demarcation either in time or in severity or character of manifestations. In some instances the only evidence of invasion of the meninges has been the presence of meningococci in otherwise normal spinal fluid. Conversely, a patient may have symptoms of meningitis with equivocal clinical findings, such as slight stiffness of the neck, and yet have normal spinal fluid. The cases to be reported in detail also illustrate some of the various forms that meningococcic infection may assume.

TABLE 4.—*Summary of Cases of Meningococcemia*

Patient	Age	Months of Service	Prodromal Symptoms, Duration in Days: Infection of Upper Respiratory Tract	Prodromal Symptoms, Duration in Days: Fever	Signs and Symptoms: Infection of Upper Respiratory Tract	Signs and Symptoms: Chill	Signs and Symptoms: Fever	Signs and Symptoms: Headache	Signs and Symptoms: Nausea	Signs and Symptoms: Pain in Joints	Signs and Symptoms: Rash	Signs and Symptoms: Severity *	Laboratory Findings: Blood Culture †	Laboratory Findings: White Blood Cells	Treatment with Sulfadiazine: Initial Dose, Gm.	Treatment with Sulfadiazine: Total Dose, Gm.	Treatment with Sulfadiazine: Days of Therapy	Treatment with Sulfadiazine: Average Blood Level, Mg. per 100 Cc.	Complications: Microscopic Hematuria	Fever, Duration in Days After Institution of Therapy	Rash, Duration in Days After Institution of Therapy
1	23	56	0	25	0	0	+	0	0	+	+	1	I	12,600	4	42	8	13.8	+	0	8 ‡
2	24	1	10	1	+	0	+	0	+	+	+	1	0	27,300	4	66	11	11.7	0	?	5
3	20	8	0	1	0	+	+	+	+	0	+	1	I	26,000	7½	68	8	12.4	+	3	3
4	20	1	14	1	+	0	+	+	+	0	+	1	0	8,900	5	62	10	7.5	0	5	11
5	24	16	1	1	+	+	+	+	+	0	+	1	I	27,900	5	53	7	11.2	+	1	5
6	21	2	14	13	+	+	+	+	0	0	+	2	IIA	16,300	4	50	5	11.4	0	½	5
7	31	2	7	½	+	0	+	+	0	0	+	1	0	20,700	4	37	6	11.5	0	1	5
8	20	1	5	½	+	0	+	+	+	0	+	1	I	18,200	5	76	8	12.5	+	2	5
9	20	1	9	9	+	0	+	+	+	+	+	1	0	12,900	4	58	6	10.4	+	2	4
10	20	1	0	1	0	0	+	+	+	+	+	1	0	19,000	4	63	7	9.7	+	5	4 ‡
11	25	15	15	1	+	+	+	+	+	0	+	2	I	17,900	5	61	8	12.4	+	1	6
12	20	1	4	1	+	+	+	+	+	0	+	2	0	20,400	4	62	9½	10.6	+	3	6 ‡
13	37	½	8	1	+	0	+	+	0	+	+	1	I	14,400	4	53	7	10.2	+	1	5
14	23	10	0	1	0	0	+	+	+	+	+	1	0	13,800	4	46	7½	11.2	0	1	4
15	26	6	5	1	+	+	+	0	+	+	+	1	I	5,800	5	45	7	10.5	0	3	? ‡
16	23	2	1	½	+	0	+	+	0	0	+	1	I	17,100	3	39	3	10.8	0	1	?
17	22	8	2	1	+	+	+	+	0	0	+	1	0	20,100	4	38	5½	9.0	+	1	3
18	19	1	12	2	+	+	+	+	0	0	+	1	0	19,700	4	36	7	9.1	0	2	3
19	20	1	3	1	+	+	+	0	+	0	+	2	I	14,600	4	43	6	7.8	0	2	?
20	19	1	10	7	+	0	+	+	0	0	+	1	0	8,400	4	49	6	9.4	0	3	2
21	20	1	2	½	+	+	+	+	+	0	+	2	I	16,200	4	40	6	6.9	0	2	4
22	21	3	0	½	0	0	+	+	+	0	+	1	I	24,500	5	40	6	10.9	0	1	3
23	24	24	0	½	0	0	+	0	0	+	+	1	0	12,500	4	34	7	11.0	0	1	1 ‡
24	25	1½	9	1	+	0	+	+	0	+	+	1	0	13,800	4	36	6	10.1	+	1	4 ‡
25	20	2	0	23	0	0	+	0	+	+	+	2	II	18,600	4	40	5	8.2	0	0	2
26	19	1	5	1	+	+	+	+	+	+	+	1	I	17,600	4	46	7	8.0	0	2	3
27	26	3	½	½	+	+	+	+	+	0	+	2	I	17,600	4	41	5½	9.0	0	1	2
28	36	4	6	6	+	0	+	0	0	+	+	1	0	10,800	4	28	4	6.7	0	1	2
29	34	1	15	1	+	0	+	+	0	0	+	1	I	19,800	4	29	5	6.3	0	2	3
30	30	11	1	1	+	+	+	+	+	0	+	1	+	30,800	4	20	3	4.8	0	1	3
31	19	1	½	1	+	+	+	+	+	0	+	3	+	8,100	4	34	5½	5.6	0	5	4
32	20	2	½	1	+	+	+	+	0	0	+	1	0	20,100	4	25	3	9.0	0	1	2 ‡
Aver. or per cent		6.4	3.3		78%	47%	100%	78%	59%	37%	100%		56%	17,000	4.2	45.6	6.4	9.7	34%	1.8	4

* The severity is graded 1 (mild), 2 (moderate) and 3 (severe).
† Roman numerals indicate the types of meningococcus cultured. A plus sign indicates presence of meningococcus which was not typed.
‡ Comment: patient 1, chronic; patient 10, white blood cells 3,400 (polymorphonuclears 58%) 5th day of treatment; patient 12, white blood cells 4,000 (polymorphonuclears 52%) 7th day of treatment; patient 15, white blood cells 4,000 (polymorphonuclears 49%) 5th day of treatment; patient 23, white blood cells 4,100 (polymorphonuclears 70%) 2d day of treatment; patient 24, white blood cells 4,000 (polymorphonuclears 58%) 3d day of treatment; patient 32, white blood cells 4,600 (polymorphonuclears 44%) 2d day of treatment.

CASES ILLUSTRATIVE OF VARIATIONS IN MENINGOCOCCEMIA

There may be a simple acute form of meningococcemia with fever, malaise, pains in joints, rash and leukocytosis. The progress of the disease may be arrested in this stage by sulfadiazine therapy as illustrated in patient F. J. T. (29, table 4):

F. J. T., a soldier aged 34, had had a slight cold for about two weeks before admission to the Station Hospital. During the afternoon of the day prior to admission he rather suddenly began to feel unusually tired and to ache all over. During the night he had chilly sensations alternating with feverishness, and on the morning of admission he had a moderately severe headache. He was acutely but not seriously ill. His face was flushed and his temperature was 101.3 F. There was slight inflammation of the nose and throat, and a macular, papular and petechial rash was scattered over the trunk and all extremities. Neurologic examination gave results entirely normal. The white blood cell count was 19,800 per cubic millimeter with 81 per cent polymorphonuclear leukocytes. Blood cultured on admission was positive for type I meningococcus. No lumbar puncture was done. As soon as the blood for culture had been taken, sulfadiazine was given by mouth. The temperature was normal within two days.

The disease may be relatively mild and subacute, so that the fever, malaise, pains in joints and rash may suggest rheumatic fever, erythema multiforme or some other infection. The illness of patient C. W. Y. (6, table 4) is illustrative of this type:

Private C. W. Y., aged 21, had been well until three days before admission, when he suddenly had a shaking chill with development of fever, malaise and sore throat. The only significant findings were a few erythematous blotches on the chest and the legs and a palpable spleen. There was a continuous fluctuating fever during the succeeding eleven days. A rash consisting of macular, papular and nodular lesions with a few petechiae appeared in crops. Shortly after admission redness, tenderness and swelling of the right ankle developed. These findings suggested erythema multiforme and erythema nodosum. The blood leukocyte count was 16,300 per cubic millimeter with 73 per cent polymorphonuclear cells. Many erythrocytes were noted in several specimens of urine. The spinal fluid was normal. Blood cultures were positive for type IIA meningococcus. After the first dose of sulfadiazine by mouth, the temperature became and remained normal. The rash faded promptly.

In other patients the course may be chronic, producing a persistent, low grade febrile illness which in patient R. L. P. (1, table 4) was not severe enough to prevent him from continuing military duty:

Staff Sergeant R. L. P., aged 23, was admitted to the orthopedic service because of an injured ankle. It was learned that for about three weeks he had been suffering from malaise,

TABLE 5.—*Summary of Findings*

Patient	Age	Months of Service	Symptoms, Duration in Days Before Diagnosis: Infection of Upper Respiratory Tract	Fever	Meningeal Symptoms	Symptoms: Infection of Upper Respiratory Tract	Headache	Nausea	Chill	Fever	Pains in Joints	Clinical Findings: Stupor	Stiff Neck	Rash	Severity *	Cultures: Blood	Cerebrospinal Fluid
1	26	13	5	2	1	+	+	+	+	+	0	0	+	+	2	+	0
2	22	14	0	1	1	0	+	0	0	+	0	0	+	0	2	0	0
3	26	..	0	1	2	0	+	+	0	+	0	+	+	0	3	0	+
4	27	3	0	2	2	0	+	+	+	+	0	+	+	+	3	I	0
5	20	3	20	14	1	+	+	+	+	+	+	+	+	+	3	..	..
6	31	1	7	2	1	+	+	+	+	+	0	+	+	0	3	..	0
7	18	1	42	16	1	+	+	+	+	+	0	0	+	+	3	0	I
8	28	13	0	1	1	0	+	+	0	+	0	0	+	+	2	0	I (0)
9	23	15	0	1	1	0	+	0	+	+	0	+	+	0	2	+	(0) I
10	27	24	0	10	1	0	+	+	+	+	+	0	+	0	2	0	+
11	22	7	0	1	1	0	+	+	0	+	0	0	+	0	2	0	0
12	19	21	0	3	3	0	+	+	0	+	0	0	+	0	1	0	0
13	54	4	14	11	?	+	+	+	0	+	0	+	+	0	2	..	0
14	24	8	0	6	1	0	+	+	0	+	+	0	+	+	3	0	I
15	30	6	1	1	1	+	+	0	0	+	0	+	+	+	3	I	I
16	21	2	1	1	1	+	+	+	0	+	0	0	+	0	2	0	I
17	20	1	2	2	½	+	+	+	+	+	0	+	+	0	4	0	I
18	27	1	3	3	1	+	+	+	+	+	0	+	+	+	3	0	I
19	24	31	2	1	1	+	+	0	0	+	0	+	+	0	3	(0)	(0)
20	19	1	4	1	1	+	+	+	0	+	0	+	+	+	2	+	+
21	20	1	3	1	1	+	+	+	0	+	0	0	+	+	2	+	I
22	22	3	3	1	1	+	+	+	0	+	0	0	+	+	3	+	I
23	26	1	18	1	½	+	+	+	+	+	+	+	+	+	3	+	I
24	19	1½	0	1	1	0	+	+	0	+	+	0	+	+	1	+	0 I
25	29	5	0	1	1	0	+	+	0	+	0	0	+	+	1	0	I
26	20	7	1	1	1	+	+	+	+	+	+	0	+	+	2	0	I
27	24	9	3	2	2	+	+	+	+	+	0	0	+	+	1	+	I
28	20	4	2	2	2	+	+	+	0	+	0	0	+	+	2	0	I
29	23	3	3	2	1	+	+	0	+	+	+	0	+	+	2	0	I
30	21	3	0	1	1	0	+	+	0	+	0	0	+	+	3	+	I
31	27	66	6	6	1	+	+	+	+	+	0	0	+	+	1	0	I I
32	23	5	3	3	1	+	+	+	+	+	0	+	+	+	3	0	I
33	29	1	30	1	1	+	+	+	+	+	0	+	+	+	3	+	I
34	25	1	1	1	½	+	+	+	+	+	0	0	+	+	2	0	+
35	33	25	0	½	½	0	+	+	+	+	0	+	+	+	3	0	I
36	37	1	35	1	½	+	+	+	+	+	+	+	+	+	4	0	I (0)
37	19	1	28	1	1	+	+	+	+	+	0	0	+	+	3	I	(0)
38	21	25	0	½	½	0	+	+	0	+	0	+	+	+	2	0	0
39	18	1	14	1	1	+	+	+	+	+	0	0	+	+	3	+	I
40	19	1	8	6?	½	+	+	+	+	+	0	0	+	+	1	+	I
41	22	18	0	½	½	0	+	+	+	+	0	+	+	+	3	+	I
42	21	1½	18	12	½	+	+	+	+	+	0	0	+	+	2	+	I
43	22	1	17	½	½	+	+	0	0	+	0	0	+	+	1	+	I (0)
44	19	2	3	1	1	+	+	+	+	+	0	+	+	+	2	0	0
45	19	1½	0	1	1	0	+	+	0	+	0	0	+	+	1	0	I
46	21	1	?	?	1	+	+	+	0	+	0	0	+	+	2	+	I
47	18	1	7	3	½	+	+	+	0	+	0	+	+	+	1	0	I
48	20	1	17	9	1	+	+	+	0	+	0	+	+	+	2	0	0
49	22	7	5	2	1	+	+	+	0	+	+	0	+	+	1	I	I
50	20	1	1	1	1	+	+	+	+	+	0	0	+	+	2	I	I
51	20	1	12	1	0	+	0	0	+	+	+	0	0	+	1	I	I
52	20	1	3	1	1	+	+	+	+	+	0	+	+	0	2	0	I
53	20	1½	0	3	3	0	+	+	0	+	0	0	+	+	2	0	I
54	20	1½	3	1	½	+	+	+	+	+	0	0	+	+	3	I	I
55	19	1	13	1	1	+	+	+	0	+	0	0	+	0	2	0	I
56	30	1½	5	1	1	+	+	+	0	+	+	+	+	+	2	0	I
57	21	2	2	½	1	+	+	+	+	+	+	0	+	+	2	I	I
58	20	¼	17	2	½	+	+	+	0	+	+	0	+	+	2	I	I (0)
59	19	1	0	2	2	0	+	+	0	+	+	0	+	+	2	0	I
60	28	1	4	1	½	+	+	+	0	+	+	+	+	0	3	0	I
61	22	3	0	1	1	0	+	+	0	+	0	0	+	+	2	0	I
62	29	2	0	½	½	0	+	+	0	+	0	+	+	+	2	I	I
63	28	1½	23	1	1	+	+	+	+	+	+	+	+	+	2	0	I
64	20	1	0	½	½	0	+	+	+	+	0	0	+	+	2	I	I (0)
65	28	1	3	2	½	+	+	+	0	+	0	+	+	+	2	0	I
66	20	1	11	½	½	+	+	+	0	+	0	0	+	+	1	+	0 (0)
67	34	4	0	2	1	0	+	+	0	+	0	0	+	+	1	0	0
68	29	4	0	2	2	0	+	+	+	+	0	0	+	+	1	0	I
69	21	1	0	1	1	0	+	+	+	+	0	+	+	+	2	0	I
70	25	21	0	½	1	0	+	+	0	+	0	0	+	+	1	0	I
71	20	1	0	1	1	0	+	+	0	+	+	+	+	+	3	0	I
72	20	1	0	½	½	0	+	+	+	+	0	0	+	+	1	I	(0)
73	31	13	0	1	1	0	+	+	+	+	0	+	+	+	3	+	I
74	20	2	0	1	½	0	+	+	+	+	0	+	+	0	2	+	I
75	32	4	60	1	1	+	+	+	+	+	0	+	+	+	2	0	I
76	19	2	0	2	3	0	+	+	0	+	0	0	+	+	1	0	0
77	22	2½	0	1	1	0	+	+	+	+	+	+	+	+	2	0	I
78	31	10	0	½	½	0	+	+	0	+	0	+	+	+	2	0	I
79	20	1	30	1	½	+	+	+	+	+	0	+	+	+	2	0	I
80	25	13	0	1	½	0	+	+	+	+	+	0	+	+	1	0	+
Average or per cent.....			10.9	2.2	0.99	58%	99%	91%	51%	100%	24%	44%	99%	83%		40%	81%

* The severity is graded 1 (mild), 2 (moderate), 3 (severe) and 4 fulminant.

† Roman numeral I indicates type I meningococcus. A zero means no meningococcus was found. A plus sign indicates presence of a meningococcus which was not typed. Bacteriologic data in parentheses indicate specimens were obtained after initiation of chemotherapy.

‡ Patients 1 and 2 were treated with sulfapyridine.

Laboratory Findings †				Treatment with Sulfadiazine ‡					Meningeal Signs, Duration in Days After Institution of Therapy	Fever, Duration in Days After Institution of Therapy	Complications of Therapy		Comment
Cerebrospinal Fluid													
Smear	Cell Count	Sugar, Mg. per 100 Cc.	White Blood Cells	Initial Dose, Gm.	Total Dose, Gm.	Days of Therapy	Average Blood Level, Mg. per 100 Cc.	Average Cerebrospinal Fluid Level, Mg. per 100 Cc.			Microscopic Hematuria	Gross Hematuria	
0	9,800	77	20,200	7½	97	5	16.8	6.2	8	16	+	0	
0	9,100	41	14,800	7½	119	8	8.5	3.3	5	3	0	0	
+	4,820	53	15,400	5	69	11	15.0	11.0	3	3	0	0	Transient right 6th nerve paralysis
+	69	81	14,000	7½	73	6	12.9	11.0	6	2	0	0	Transient left 6th nerve paralysis
	37,277												
+	6,187	44	11,500	7½	68	8	11.5	7.8	5	11	0	0	Transient right 7th nerve paralysis
+	10,700	..	21,700	7½	130	9	11.9	12.0	5	5	0	0	Transient right 7th nerve paralysis
0	13,800	1	33,600	7½	201	19	12.8	9.7	7	5	0	0	
+	1,100	31	24,200	7½	116	9	14.8	...	6	5	0	0	
(0)	25												
(0)	47	..	.....	...	81	4				2			
+	5,700	62	21,900	7½	150	11	17.7	20.8	10	5	+	0	W.B.C. 4,500 (polymorphonuclears 52%) 9th day of treatment
0	2,800	52	12,200	7½	40	3	21.1	19.4	4	14	+	+	Anuria; sulfadiazine stopped
0	12,111	..	16,400	7½	118	10	17.6	8.8	3	1	0	0	W.B.C. 3,200 (polymorphonuclears 47%) 12th day of treatment
0	12,500	1	19,000	7½	62	8	8.1	6.5	2	1	0	0	
0	1,990	36	28,500	5	60	4	18.0	13.8	?	3	0	0	
0	6,942	..	15,300	7½	72	9	13.3	9.9	2	5	+	0	
+	4,400	14	16,400	7½	87	9	11.9	13.0	6	4	+	0	
+	3,339	45	15,300	7½	80	8	13.3	5.6	4	5	+	0	
+	6,345	10	13,700	7½	13	1	....	...	2	1	0	0	Died
+	7,040	0	21,000	7½	90	12	10.7	2.3	4	11	+	0	Initial dose of sulfathiazole
(0)	5,500	78	.....	7½	79	9	11.2	6.0	3	6	+	0	
+	4,100	8	33,500	7½	92	10	12.5	6.0	8	4	+	0	Transient right 6th nerve paralysis
+	10,900	18	20,800	7½	92	9	11.0	8.7	5	12	+	0	
+	3,300	4.3	19,600	7½	95	10	12.0	...	6	5	+	0	
+	3,800	13	20,000	7½	87	9	11.8	...	7	5	+	0	W.B.C. 5,200 (polymorphonuclears 36%) 5th day of treatment
0	3	78	17,400	7½	94	10	11.4	...	3	4	+	0	Eight hours between examinations of cerebrospinal fluid
0	500	68											
+	11,240	42	16,600	7½	66	8	14.6	...	2	2	+	0	
+	6,700	8.3	18,500	7½	88	11	14.4	...	6	4	+	0	
+	4,500	15	16,400	7½	101	9	9.1	...	5	2	+	0	
+	2,580	43	22,900	8	100	11	12.1	...	5	2	+	0	
+	16,320	5	15,500	7½	54	12	14.9	14.0	8	12	+	0	
+	12,100	28	24,000	8	15	1	9.3	...	6	5	+	+	Twelve hour anuria necessitated change to sulfanilamide
					90	9½	10.6	7.1					
0	13	105	14,800	6	57	10	12.3	14.5	4	3	+	0	Typical renal colic
0	3,700	73											
+	3,000	..	22,800	8	91	13	15.3	28.0	8	6	+	Slight	
+	14,230	6	23,200	7½	150	14	12.8	9.3	8	8	+	0	Transient right 7th nerve paralysis
+	23,000	8.5	32,800	6	109	11	13.8	...	6	6	+	0	
+	15,600	1	22,200	7½	15	1	12.5	10.2	9	7	+	+	Change to sulfanilamide
					101	11½	11.9	9.8					
+	3	75	17,600	5	20	2	17.7	8.2	7	8	+	+	Gross hematuria with oliguria; sulfanilamide substituted
(0)	17,700	0.6	.....	..	63	8½	9.5	10.8					
(0)	13,600	73	30,800	7½	27	3	21.5	14.9	4	7	+	+	Sulfanilamide substituted
					74	7	11.9						
0	12,600	31	19,900	7½	102	7	13.3	...	5	5	+	0	
+	6,800	40	25,900	6	69	10	13.6	...	6	3	+	0	
0	27	79	27,600	3	57	6	11.3	...	4	2	+	0	
+	5,000	12	22,500	8	16	1	13.0	...	6	5	+	+	Sulfanilamide substituted
					83	8	12.4	...					
+	9,700	53	17,200	5	65	10	12.8	...	2	1	0	0	
0	11	65	32,000	7½	83	7½	14.3	14.4	3	6	+	0	Corneal ulcer
(0)	885												
0	7,100	43	30,500	7½	82	8	11.6	...	3	2	+	0	
0	7,800	53	12,400	5	49	8	10.9	...	4	2	+	0	
+	9,500	8.1	28,800	7	72	10	10.0	7.5	5	8	0	0	
+	1,900	70	31,800	4	59	6	10.2	...	2	3	0	0	
+	9,400	1	17,400	4	49	8	8.7	4.4	7	2	0	0	
+	916	64	23,800	7½	10	1	14.3	...	8	5	+	+	Sulfanilamide substituted
					58	7	11.8	...					
0	115	55	31,900	5	41	5½	9.9	...	5	1	0	0	
0	5	70	24,100	4	39	6	7.3	...	0	1	0	0	
+	10,200	1	21,800	4	50	9	8.6	...	4	4	+	0	
0	6,100	34	15,300	4	49	8	9.5	...	6	1	0	0	Bilateral 8th nerve deafness; improving
+	269	80	28,650	4	62	8	9.3	...	8	5	0	0	Pulmonary edema
+	11,500	28	22,200	4	47	7	9.3	...	3	3	+	0	
+	3,500	48	10,900	4	85	10	11.0	...	6	3	0	0	
+	2,300	46	41,000	4	60	8	7.5	5.3	5	10	+	0	Effusion in knee joint
0	0	72	.....	4	50	8	10.0	7.3	5	4	0	0	Obstructive jaundice
(0)	5,900	75	24,800										
+	5,100	1	21,800	4	56	9	10.7	...	6	3	0	0	
+	11,300	1.5	18,400	4	77	9	10.2	...	10	3	+	0	
+	10,700	58	27,000	4	60	8½	8.3	...	10	2½	0	0	
+	10,600	20	22,300	4	50	8	8.1	...	5	3	0	0	
+	9,100	16	43,500	5	60	8	9.0	...	5	2	+	0	Pain in region of bladder
0	42	87	12,400	4	64	8	9.3	9.7	5	7	+	0	
(0)	945	69											
+	8,300	45	16,800	4	53	11½	10.7	...	6	1	0	0	
0	0	73	22,700	4	57	8½	10.3	...	5	3	+	0	Meningeal signs developed after treatment for meningococcemia started
(0)	226	68											
+	5,900	71	13,100	4	48	7½	8.3	...	5	2	0	0	W.B.C. 4,000 (polymorphonuclears 48%) 2d day of treatment
+	112	76	19,200	4	52	8½	8.3	...	4	2	0	0	
+	7,500	35	16,800	4	65	8	10.1	...	4	2	0	0	
+	7,700	64	15,500	5	53	6½	5.8	...	3	2	0	0	
+	9,900	34	18,800	4	55	8	7.1	...	5	3	+	0	W.B.C. 3,700 (polymorphonuclears 43%) 3d day of treatment
(0)	8,400	47	19,700	4	38	6	6.3	3.5	4	2	0	0	
+	7,600	14	26,800	4	62	7	6.8	...	5	4	0	0	Transient right 8th nerve paralysis
+	5,900	..	19,800	4	60	7	6.3	6.8	10	7	+	0	
+	15,100	13	22,700	4	45	6	6.5	...	6	4	0	0	
0	4,500	55	11,600	4	38	4½	5.3	...	4	4	0	0	
+	13,700	1	25,100	6	54	6	6.9	...	5	2	+	0	
+	12,700	..	21,200	5	43	6	7.8	...	4	3	+	0	
+	6,400	1	23,900	4	39	5	5.9	...	5	1	+	0	
0	7,100	45	10,500	5	65	7	6.9	...	4	0	+	0	W.B.C. 4,300 (polymorphonuclears 45%) 4th day of treatment; renal colic
70%	6,800	40.3	21,600	Group A	87	9.6	12.9	10.9	5.1	4.9	71%	17%	
				Group B	54	7.5	8.4	6.5	5.1	3.0	30%	0	

evening feverishness and an intermittent eruption of red nodules on his legs. While he was in the hospital his temperature ranged from normal to 102 F. There was migrating arthralgia, and a scattered erythematous papular rash appeared. This was most apparent on the extremities. The blood leukocyte count was 12,600 per cubic millimeter with 81 per cent polymorphonuclear leukocytes. Two blood cultures were positive for type I meningococcus. There were no meningeal symptoms or signs at any time, and the spinal fluid was normal. All manifestations cleared entirely within twenty-four hours after sulfadiazine began to be administered by mouth. The illness had been of four weeks' duration prior to treatment.

CASES ILLUSTRATIVE OF TRANSITION FROM SEPSIS TO MENINGITIS

The recognition of meningococcic sepsis before invasion of the meninges has occurred is relatively easy during epidemics, when the index of suspicion is high. It is in the sporadic case that delay in diagnosis and treatment is likely. This occurred in the following case:

Private O. E. M. (patient 5, table 5), aged 20, was admitted with a history of sore throat which had been present for one week. On the day before admission there was a sudden onset of shaking chills, fever and painfulness of joints. There were a few small erythematous nodular lesions of the skin, and the pharynx showed mild inflammation. Both knees and both elbows and the right wrist and ankle were tender and hot but not red or swollen. The blood leukocyte count was 11,500 per cubic millimeter with 78 per cent polymorphonuclear cells. A tentative diagnosis of acute rheumatic fever was made, and a full dosage of salicylates was prescribed. In spite of this medication the temperature ranged from normal to 102.4 F. for the succeeding thirteen days. On the thirteenth hospital day there was a sudden rise in temperature to 105 F. with severe headache, nausea and vomiting. Within three hours the patient had lapsed into coma and presented all of the signs of severe meningitis. A dozen or so pinkish macules resembling rose spots were present on the trunk at this time. The spinal fluid contained 1,200 white blood cells per cubic millimeter with 95 per cent polymorphonuclear leukocytes. Meningococci were demonstrated in the spinal fluid. Treatment with sulfadiazine was begun before blood was taken for culture and there was no growth.

It is felt that the septic type of temperature, the involvement of many of the larger joints and the intermittent rash justify the assumption that invasion of the blood stream was present for many days before the development of meningitis.

The next case illustrates the importance of cutaneous manifestations and how the presence of only a fleeting rash during the greater portion of the stage of sepsis delayed diagnosis:

Private W. D. (patient 42, table 5) was admitted to the ward for patients with diseases of the respiratory tract, having had a cold with nasal congestion, slight cough and sore throat for one week. During the day before admission he had several slight chills and felt feverish. He vomited once. Examination revealed moderate inflammation of the nasopharynx and a discrete macular rash on the trunk and around the shoulder girdle, which disappeared within a few hours after admission. For about eleven days the patient's temperature was of the septic type with daily elevations to 102 F., associated with polymorphonuclear leukocytosis. He complained of intermittent pain in the popliteal spaces, and it was thought that the tip of the spleen was palpable. A tentative diagnosis of subacute bacterial endocarditis was made, and repeated blood cultures were made. Ten days after admission the temperature rose to 103 F. and the patient appeared worse. There were no meningeal signs or symptoms. On the next day increasingly severe headache developed with nausea and vomiting. Examination revealed a slightly stiff neck, Kernig's sign and a sparse scattering of petechiae on the upper part of the trunk. The spinal fluid was cloudy and contained 9,700 cells per cubic millimeter; smear and culture showed type I meningococcus. The blood taken on the day before the development of meningeal signs later gave a culture of the same organism. Recovery was rapid on sulfadiazine therapy.

The speed with which meningitis may develop in a patient with meningococcemia is extremely variable. Patient J. R. V. (36, table 5) was one in whom early meningitis was present on admission, as indicated by recovery of meningococci on culture from an otherwise normal spinal fluid. The history, however, gives clear-cut evidence that a state of sepsis existed for about twenty-four hours before admission. This case also illustrates how rapidly meningitis can advance in spite of prompt and adequate sulfadiazine therapy. Two complications occurred.

Private J. R. V., aged 37, was one of the few patients observed by us who were known to have been in contact with another soldier with established meningococcic infection. He had been in good health except for intermittent colds until the day before admission. During the morning of that day he suddenly had a shaking chill and began to feel extremely weak. Headache was moderately severe but subsided during the evening. On the morning of the day of admission his headache was gone, but he noticed that he was covered with tiny dark purplish spots. His right knee was also moderately painful on walking. Severe frontal headache again developed on his admission to the ward. He was obviously acutely and seriously ill, although alert and well oriented. Scattered over the trunk and all extremities were myriads of dark petechiae, all less than 2 mm. in diameter. There was no stiffness of the neck, and Kernig and Brudzinski signs were not present. A specimen of spinal fluid showed 3 lymphocytes per cubic millimeter, a normal concentration of sugar and a smear negative for organisms. By the following day, however, this fluid on culture grew type I meningococcus. Immediately after the initial lumbar puncture 5 Gm. of sodium sulfadiazine was given intravenously with 1,500 cc. of saline and dextrose solution.

Four hours after admission the patient was seized with projectile vomiting and rapidly became stuporous. All the signs of meningitis were present to a high degree. Five and one-quarter hours after the first lumbar puncture another specimen of spinal fluid was obtained. The spinal fluid was under greatly increased pressure and contained 17,700 leukocytes per cubic millimeter with 99 per cent polymorphonuclear cells. The concentration of sugar had fallen to 0.6 mg. per hundred cubic centimeters, and the level of sulfadiazine had reached 8.2 mg. per hundred cubic centimeters. Smear and culture of this second specimen were negative for meningococci in spite of the addition of paraaminobenzoic acid to the culture mediums.

During the next few days the patient's course was extremely stormy. For the first two days the level of sulfadiazine in the blood was maintained at from 15 to 20 mg. per hundred cubic centimeters by parenteral administration of the sodium salt. By the evening of the second day gross hematuria and oliguria developed, and sulfanilamide 10 Gm. daily was substituted. The hematuria cleared rapidly, but pulmonary edema developed to an extreme degree, and the patient responded very slowly when treated with oxygen, tourniquets on the extremities and venesection. He subsequently made a complete recovery.

The blood culture made on admission was contaminated with Staphylococcus albus, and no meningococci were found. The history of a shaking chill, the presence of a purpuric rash extensive enough to be noticed by the patient and a painful knee joint, all at a time when the patient was entirely free of headache, are believed to be evidence that invasion of the blood stream occurred several hours prior to admission. That meningitis was in the earliest phase at the time of admission is shown by the fact that the spinal fluid was normal in every respect except that meningococci were grown on culture. There were no meningeal signs present except for severe headache.

The following case is similar to the preceding one in the rapidity with which the meninges became involved

but differs from it in that meningococcemia was present before meningitis was demonstrable:

Private S. S. (patient 24, table 5), aged 19, was seen early in the period of increased incidence of meningococcic disease when we were not so familiar with all of the types of rash associated with this infection. He had been perfectly well until the day before admission, when headache, vomiting and extreme weakness suddenly developed. He was pale, prostrated and obviously acutely ill. Careful search of his entire body showed a total of six faint, ill defined rosy macules. There were no meningeal signs, and the patient's description of his headache indicated that it did not differ from that experienced with simple infections of the upper respiratory tract. His appearance and the blood leukocyte count of 17,400 per cubic millimeter with 89 per cent polymorphonuclear cells indicated that meningococcic infection was probable. An examination of the spinal fluid on admission gave negative results. Eight hours later a revaluation of the patient's status showed a considerable increase in the rash, which now was maculopapular, with a moderate number of petechiae scattered over the trunk and upper extremities. There was a suggestion of stiff neck, although Kernig's sign was still not observed. Another lumbar puncture yielded slightly turbid fluid with 500 cells per cubic millimeter, 80 per cent of which were polymorphonuclear leukocytes. The smear was negative for organisms, but type I meningococcus was grown on culture. This organism was later recovered from the blood taken at the time of the first examination of the spinal fluid. Sulfadiazine therapy was started after the second lumbar puncture, eight hours after the patient's admission to the hospital. He made an uneventful recovery.

Patients have since been seen whose disease was so much more fulminant that it is doubtful if they would have survived had therapy been delayed eight hours. Infection of the cerebrospinal spaces may have been produced by lumbar puncture in a patient suffering from sepsis. It is more likely, however, that the meningitis in this patient was the result of the normal progress of the disease. That meningitis may have been present in the region of the choroid plexus at the time of the first lumbar puncture is possible.

A CASE ILLUSTRATIVE OF THE COMMONEST TYPE OF MENINGITIS

The following case illustrates the commonest type of meningococcic infection. Here the results of the meningeal involvement were so dramatic as to overshadow completely those of sepsis. Sepsis and meningitis set in almost simultaneously.

Private R. A. B. (patient 71, table 5), aged 20, was admitted in a violent negativistic delirium. The history obtained after the patient had improved indicated that he had been perfectly well until the evening of the day before admission, when severe occipital headache suddenly developed with a feeling of great fatigue. During the night pain in the left elbow and ankle began. Early on the day of admission he lost consciousness and regained it only after twelve hours of treatment in the hospital. Examination revealed a gravely ill patient who had many small erythematous macules scattered over the trunk and extremities. Several of the lesions were hemorrhagic. There were pronounced rigidity of the neck, Kernig and Brudzinski signs and slight weakness of the right side of the face. The blood leukocyte count was 18,800 per cubic millimeter with 80 per cent polymorphonuclear cells. The blood culture was later reported as negative, but the spinal fluid showed 9,900 leukocytes per cubic millimeter, of which 99 per cent were polymorphonuclear cells. Gram negative intracellular diplococci were seen on smear, and type I meningococcus was present on culture of the spinal fluid. Immediate sulfadiazine therapy resulted in complete recovery.

TREATMENT

The treatment of the soldiers with meningococcemia was simple and effective. During the period of observation of this group of patients it became obvious that those with uncomplicated meningococcemia who were treated early did not require large doses of sulfadiazine. An initial dose of 4 Gm. of sulfadiazine was given, followed by 1 Gm. every four hours until the temperature had been normal for two days. Parenteral administration was resorted to when patients were vomiting.

Seventy-eight of the 80 patients with meningococcic meningitis were treated with sulfadiazine; the other 2 received sulfapyridine and recovered. Two patients who did not respond rapidly to sulfadiazine were given polyvalent antimeningococcic serum intravenously and recovered. In 6 of the sulfadiazine treated patients renal complications developed severe enough to make it necessary to substitute sulfanilamide for sulfadiazine.

The first 45 of the sulfadiazine treated patients will hereafter be designated group A, and the last 33, who were treated with smaller dosage, will be referred to as group B.

TABLE 6.—*Comparative Results of Treatment in Groups A and B* *

Group †	Total Dose of Drug, Gm.	Duration of Therapy, Days	Sulfadiazine Level, Mg. per 100 Cc.		Duration of Meningeal Signs Following Therapy, Days	Duration of Fever Following Therapy, Days	Duration of Hospitalization Following Therapy, Days	Percentage with Renal Complications	
			Blood	Spinal Fluid				Gross Hematuria	Anuria
A (45 patients).....	87	9.6	12.9	10.9	5.1	5.1	34	15	6.6
B (33 patients).....	54	7.5	8.4	6.5	5.1	3.0	29	0	0

* The figures are averages.
† Two of the 80 patients were treated with sulfapyridine and are not included in this table.

Group A received an initial intravenous "loading" dose of 0.1 Gm. of sodium sulfadiazine per kilogram of body weight. A dose one half of the initial dose was given parenterally every eight hours thereafter until the patient could retain the drug given by mouth. Most of the subsequent parenteral therapy was given subcutaneously. A concentration of 0.5 per cent or less of sodium sulfadiazine in isotonic solution of sodium chloride or sterile distilled water was used. Sulfadiazine was then administered by mouth, 1.0 to 2.0 Gm. every four hours, until the temperature had been normal for from five to seven days. This dosage was adjusted when necessary in an attempt to maintain the blood concentration of sulfadiazine at 15 mg. per hundred cubic centimeters. The fluid intake was maintained at 4,000 cc. daily and the urinary output at 1,200 cc. or more. Daily urinalyses, complete blood counts and determinations of the sulfadiazine level were done.

The results achieved in patients treated according to this plan were excellent. One patient with fulminant meningitis died very quickly after the diagnosis was made, but the others recovered. In the face of these good results we were slow to change the plan of therapy. However, the high incidence of renal complications made it seem advisable to reduce the dose of sulfadiazine.

Group B received an initial "loading" dose of 0.05 Gm. of sodium sulfadiazine per kilogram of body weight

intravenously and four hours later a dose of 0.025 Gm. per kilogram of body weight subcutaneously. This dose was then repeated every eight hours until the patient could retain the drug given by mouth. One gram of sulfadiazine was then given every four hours until the temperature had been normal for from five to seven days. The same fluid intake and output were maintained as in group A, with the same laboratory control.

A comparison of the results of treatment in the two groups is shown in table 6.

From an analysis of the data in table 6 it appears that the patients treated with the lower doses of sulfadiazine fared better than the group treated with the higher doses. This impression should be qualified, however, as there was a slight but definite decrease in the severity of the disease seen toward the end of this series of cases. The shorter period of hospitalization is a reflection of experience gained with the disease. Reconditioning of the patients for the trip home on furlough was begun earlier. The important difference between the two groups of patients is the lower incidence of renal complications in those receiving the smaller doses of sulfadiazine. In group A gross hematuria developed in 15 per cent of the patients and temporary anuria in 6.6 per cent. In no patient of group B, with smaller doses of sulfadiazine, did either of these complications develop. The less serious renal complications of sulfadiazine therapy, such as crystalluria and microscopic hematuria, were also much more common in the patients treated with large doses.

TABLE 7.—*Mortality*

	Cases	Deaths	Per Cent
Meningococcemia without meningitis	32	0	0
Meningococcic meningitis	80	1	1.25
Combined meningococcemia and meningitis	112	1	0.89

No anemia and no severe leukopenia were noted in any of the patients. In 1 soldier fever and a morbilliform rash developed on the sixth day of treatment with the lower doses, but this cleared after the drug was discontinued.

Complications of the disease were rare in this group of patients. Ten per cent of those with meningitis had lesions involving the sixth, seventh or eighth cranial nerve. Complete recovery occurred in all these patients except one with nerve deafness. On discharge from the hospital he was still showing progressive improvement. One patient has extensive diffuse cortical atrophy as revealed by encephalogram and is to be discharged from the Army for disability. Corneal ulceration occurred in one patient and herpes zoster of the ophthalmic branch of the fifth cranial nerve in another.

The excellent results with both treatment schedules is indicated in table 7.

COMMENT

The conclusion that meningococcic meningitis results from preceding septicemia has been reached by several previous observers. Unassailable proof that it does has never been brought forward and indeed proof may be impossible. The evidence provided by these data and other similar studies is overwhelmingly in favor of the validity of the theory. This material is presented not because the foregoing concept of the disease is not known by members of the medical profession but because it is felt that the members of the profession have not been sufficiently aware of its importance. From the practical standpoint it is vital to view this disease primarily as meningococcic septicemia. It is only in this way that the diagnosis can be made before meningitis develops with all of its grave implications. The advent of sulfonamide compounds as therapeutic agents has made this even more important than in the past, since early administration of one of these drugs brings the septicemia to an end with almost miraculous speed. It is natural to speculate on what would be the course of the disease if simple acute meningococcic septicemia should be left untreated. There is no way to ascertain this without jeopardizing the life of the patient. Those who have observed the patients who are the subjects of this report have a strong impression that many and probably most of them would have developed meningitis. It is probable that in a few of these patients the infection might have become subacute or chronic. However, it is also probable that there are mild forms of meningococcic bacteremia which are never recognized and from which spontaneous recovery takes place.

It should be noted that in only 56 per cent of these cases of meningococcemia uncomplicated by meningitis was the diagnosis confirmed by a positive blood culture. This illustrates a most important point. An accurate diagnosis of meningococcemia can and indeed must be made long before there is any report of the results of blood culture if one hopes to prevent the advent of meningitis. The clinical picture in most cases is sufficiently clear to permit a positive diagnosis. In these cases therapy with sulfadiazine was started as soon as the diagnosis was made and one blood sample taken for culture. Had therapy been delayed and repeated blood samples taken for culture, the number of cases confirmed bacteriologically would undoubtedly have been higher. It is also highly probable that the number of cases of meningitis would have been increased with resultant higher mortality.

There are many factors involved in the achievement of the low mortality rate of 1.25 per cent in this series of 80 cases of meningococcic meningitis. The patients were all young adults of military age, in whom the mortality rate has always been lowest with all methods of treatment. Most soldiers are at a high level of physical fitness before the onset of their acute illness. Under the army practice of hospitalizing soldiers with mild acute illnesses, every opportunity for early diagnosis was afforded. Early in the period of increased incidence of meningococcic infection the dispensary surgeons and ward officers were called together and reminded of the necessity and the means of early diagnosis. At this post we have been fortunate in that we have not been confronted either with the Waterhouse-Friederichsen syndrome or with septicemia so fulminant that death occurred before treatment could become effective.

It has been demonstrated that a high degree of success with a low complication rate can be attained with a dosage maintaining the blood concentration of sulfadiazine at 8 mg. per hundred cubic centimeters. It is probable that smaller doses will suffice. Further careful study is indicated to determine how much lower the dose can be brought with safety and success. Dowling and Lepper[6] have reported that no urinary calculi formed in any of their patients unless the blood level of sulfadiazine reached 9.2 mg. per hundred cubic centimeters or higher. However, when confronted with

6. Dowling, H. F., and Lepper, M. H.: Toxic Reactions Following Therapy with Sulfapyridine, Sulfathiazole and Sulfadiazine, J. A. M. A. **121**: 1190 (April 10) 1943.

fulminant infection, it is wise to achieve a high level of sulfadiazine with large doses.

In this series the use of specific serum was limited to 2 patients. It should remain part of the armamentarium for the treatment of patients with fulminant infection in whom response to sulfonamide compounds is not promptly achieved.

SUMMARY AND CONCLUSIONS

Infection with the meningococcus arises in the nasopharynx and invades the blood stream with localization in the skin, joints, meninges and other body tissues. Meningitis is the most dramatic phase of this form of septicemia.

Diagnosis in the phase of septicemia can and must be made on clinical grounds and prompt therapy instituted to prevent the advent of meningitis.

Eighty patients with meningitis and 32 with meningococcemia have been treated with sulfadiazine, with one death occurring in the former group and no deaths in the latter.

The optimal dose of sulfadiazine for the treatment of meningococcic meningitis has not yet been determined. It is probably lower than that in general use.

ADDENDUM

Through the courtesy of Dr. John H. Dingle of the Commission on Acute Respiratory Diseases, Fort Bragg, North Carolina, and Mrs. Muriel B. Stone, Thorndike Memorial Laboratory, Boston City Hospital, thread agglutinations were made on serums obtained during the acute and convalescent phases of the disease. The method employed has been previously described.[7]

Confirmation of the diagnosis by serologic methods was attempted in 71 patients, 49 of whom had meningitis and the remaining 22 meningococcemia. The serums from 18 of the patients with meningitis and 5 with meningococcemia failed to show a significant rise in the agglutinin titer. Of these 23 cases, however, 19 were proved bacteriologically. The remaining cases (31 of meningitis and 17 of meningococcemia) all showed increases in titer of from twofold to eightfold. In this group, 4 cases of meningitis and 9 of meningococcemia were not confirmed bacteriologically. Only 2 of the 22 tested cases of meningococcemia had neither bacteriologic nor serologic confirmation. It would appear, using bacteriologic and serologic criteria as indexes of specific infection, that the group of cases herein reported are quite consistently instances of meningococcic infection.

7. Thomas, Lewis; Smith, H. W., and Dingle, John H.: Investigations of Meningococcal Infection: II. Immunological Aspects, J. Clin. Investigation **22**: 361 (May) 1943.

A Strange Fact.—Each generation in America and England, or Germany and Japan, may not produce more than enough cerebral cortexes able to deal effectively and quickly with higher mathematics and the other basic intellectual operations that are needed to develop and maintain the great technology of the military or the civil industrial economy of our time. This is a strange and somewhat frightening fact. It seems possible that we may be on the way to the development in war and in peace of an economy which may demand more brains of the sort that can deal with the unequivocal manipulation of mathematical and other symbols than old Mother Biology sees fit to provide. Of course we have not reached this stage yet, but we are near enough to it so that it is clear that we must not wantonly waste any high abilities in our educational system.—Carmichael, Leonard: Education and America's War Manpower Mobilization, The *Tulanian* **17**:3 (June-July) 1943.

MENINGOCOCCIC INFECTION IN AN ARMY CAMP

LIEUTENANT COLONEL LEWIS WEBB HILL
AND
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During the period Jan. 1 to April 15, 1943, 68 patients with meningococcic infection were admitted to the Station Hospital at Camp Edwards, Massachusetts. Note that we do not say "meningitis," for many of these patients were admitted before the stage of meningitis had been reached. It is essential to bear in mind that infection with the meningococcus is divided into three stages:

1. Nasopharyngeal infection, or sometimes even tonsillitis, clinically differing in no way from such conditions produced by other organisms.

2. The stage of septicemia. The patient may die in this stage after a few hours, the infection may be overcome by proper treatment before meningitis has developed or in mild infections may be overcome by the patient himself without treatment, or the septicemia may progress in a few hours or in a day or two to meningitis. The last mentioned is the most common sequence of events.

3. The stage of meningitis.

In dealing with this epidemic, two particular things were stressed: early diagnosis and a uniform plan of treatment. Ward officers were instructed to be suspicious of any patient admitted for upper respiratory infection who vomited or complained of headache, and to do lumbar punctures on all such patients. Many of our patients with meningococcic infection were originally admitted to the wards reserved for upper respiratory diseases and usually these patients had no signs indicative of meningitis on admission. As soon as the diagnosis of meningococcic infection was made, they were transferred to the contagious ward. Although one officer (H. S. L.) was in charge of this ward, many of the patients were admitted at night when the ward was in charge of some one else. Therefore all members of the medical service at various times took part in the initial treatment. To insure uniformity, a detailed schedule of treatment was posted in the ward.

SYMPTOMATOLOGY AND PHYSICAL FINDINGS

The onset was gradual in about half of the cases, sudden in the rest. It is impossible to correlate the severity of the subsequent disease with its early manifestations. Some patients had a rather violent onset and severe initial symptoms which subsided in twenty-four to forty-eight hours, while others had mild symptoms on admission with severe symptoms appearing twelve to twenty-four hours afterward (under therapy) and continuing for several days.

The cardinal symptoms and signs most important in helping to arrive at a clinical diagnosis of meningococcic infection were headache, vomiting, chills and rash. We do not place stiff neck in the cardinal group, as this was of great diagnostic value when present but usually did not appear until some time after the other signs and symptoms mentioned.

Accessory symptoms commonly noted were conjunctivitis, nasopharyngitis, sore throat, drowsiness with inability to concentrate, backache, myalgia, arthralgia, stupor, delirium or coma. Many complained of being very weak and "out on their feet." Most of these

From Station Hospital, Camp Edwards, Massachusetts, Col. Charles E. Riley, commanding.

patients had a characteristic pallor and looked ill and toxic despite sometimes low temperatures and pulse rates. Sometimes those with the low temperatures on admission developed into the most severe cases. The admission temperatures varied between 97.6 and 105 F.

Headache.—Of the cardinal diagnostic symptoms, headache was the most constant. It was present in all of the 68 cases and varied from moderately severe to excruciating. The headache was usually generalized, though more severe in the frontal and occipital areas. The patient's description of the headache was first the sensation of dulness and mild pain in the frontal and postocular areas, accompanied by a stupid feeling and inability to concentrate, which developed in three or four hours to a severe, pounding, excruciating pain, worse than any the individual had ever before experienced. The headache was aggravated by sound, light and motion; also by heat and cold in the first twelve hours and later helped by cold. It lasted from four to eight days, slackening in severity on about the third day after treatment was begun.

Vomiting.—This is the second most important cardinal symptom and is of considerable value in arousing suspicion of meningococcic infection, for in the ordinary upper respiratory infections which are so commonly confused with early meningococcic infection when one is dealing with large numbers of sick persons vomiting is uncommon. Vomiting was present as an early symptom in 48 of our cases—nausea alone in 8. The nausea appeared simultaneously with the early dull headache and increased in severity until vomiting started. It was projectile in 12 cases. After the first vomiting of undigested food the vomitus became watery and pale green.

Chills.—Early chills were present in 57 cases. These varied from chilly sensations to severe generalized shaking, and chattering teeth.

Rash.—The rash ranged from profuse petechiae and purpura to faint pink macules. A rather insignificant appearing macular rash is just as important from a diagnostic point of view as purpura. In only 9 cases was there no rash. There were petechiae in 47. These varied from isolated petechiae on the extremities to a generalized eruption over the trunk and extremities. In 7 cases conjunctival petechiae were found. In 1 case the only evidence of vascular injury on admission was one petechia in the left conjunctiva. There were large purpuric spots in 39 cases. In no case did large purpura appear alone, but in combination with small petechiae. Petechiae often coalesced in a few hours to form a large purpuric spot. Purpuric spots were present most often on the distal parts of the extremities, occasionally on the trunk. The most common location on the trunk was the subaxillary region. One patient had profuse purpura of the extremities only, which coalesced so that there was practically no normal appearing skin visible. In 8 cases the rash was macular or blotchy and suggested erythema multiforme.

Thirteen cases presented meningococcemia only, with no signs of central nervous system irritation except headache. Headache in such cases is probably caused by edema of the brain, for the first reaction of the central nervous system to the meningococcus toxin is vascular, before there has been any actual bacterial invasion of the meninges. These patients had had symptoms of ordinary nasopharyngitis and slight headache in the field and were sent to the hospital because of petechial or purpuric rash. Some were admitted to the hospital wards with nasopharyngitis and developed a rash after they had been in a day or two. One such case is noteworthy. This soldier was admitted to a general medical ward with fever, swelling of the ankles and pain in the ankles and knees. Urinalysis done on admission showed albumin and many red blood cells. He was thought to have an acute glomerulonephritis and was so treated. One week later a maculopapular plaquelike rash appeared. A blood culture was taken and the meningococcus recovered.

Abortive Cases.—These are probably not uncommon. There were two such in our series. On admission there were fever, headache, nasopharyngitis and vomiting. There were a few very questionable petechiae. Lumbar punctures showed normal spinal fluids. As these patients did not appear seriously sick and the diagnosis of meningococcic infection was, to say the least, very questionable, no treatment was started. They were apparently well on the next day. However, blood cultures taken on admission grew out meningococci in three days. Three subsequent blood cultures taken at three day intervals were negative. No specific treatment had been given. In a large army camp, when the carrier rate is high, there are probably many such cases.

Mental Symptoms.—Stupor, coma or delirium was noted in 23 cases. Sixteen others showed slight confusion and disorientation. Ten cases showed mental excitation and apprehension. There were no major convulsions, but muscular twitchings were occasionally noted.

Stiff Neck and Various Reflexes.—Stiff neck was present in 53 cases and the Brudzinski sign in 37. The Kernig sign was present in 44 cases; in 20 of these it was somewhat questionable. Babinski, Gordon and Oppenheim signs were questionable in most cases, with only 5 showing true reactions; hence these were of little value in diagnosis. The reflexes were exaggerated in some, absent in others. Herpes simplex was present in 5 cases.

Complications.—There were 2 cases of unilateral arthritis of the knee joint. Both cases completely resolved in about two weeks, without tapping or any treatment except physical therapy. Five cases developed ocular muscle paresis; 2 were transient and lasted only forty-eight hours; 1 lasted a week, and 2 recovered only after five weeks. One patient had moderate deafness due to involvement of the eighth nerve. This cleared up entirely, however, in eight days, quite contrary to the usual course when severe deafness occurs in meningitis. One patient had right facial palsy which lasted twelve days. There were no sequelae. All patients were discharged to duty in excellent condition.

Severity.—Twenty-four cases were classified as mild, 33 as severe and 11 as very severe.

LABORATORY FINDINGS

1. *Blood.*—(*a*) White Count: The white count ranged from 7,000 to 48,000 with from 70 to 95 per cent polymorphonuclears.

There were 9 initial white counts under 10,000, 16 between 10,000 and 15,000, 13 between 15,000 and 20,000 and 30 over 20,000.

A low white count is of little value in ruling out meningococcic infection. A high count is of some value as confirmatory evidence when taken in connection with other findings.

(*b*) Culture: Of 68 taken, 40 blood cultures were positive. This is a rather high percentage and is no

doubt accounted for by the fact that most cases were seen early. Septicemia is often transitory and is most likely to exist in the early stages of the disease. The cultures showed growth in many cases after twelve hours' incubation, while in a few growth was delayed for as long as two weeks. In 13 cases the organism could not be demonstrated either by smear or by culture from the spinal fluid but was recovered from the blood.

(*c*) Blood Sugar: Blood sugar determinations were made in a few cases before intravenous dextrose was given and were found to be normal or increased. The range was from 106 to 174 mg. per hundred cubic centimeters.

2. *Spinal Fluid.*—(*a*) Appearance: The spinal fluid was clear in 31 of 62 fluids recovered. In 6 of our cases with mild, subacute or chronic meningococcemia, no lumbar puncture was done. When the cell count passed 500 the spinal fluid was opalescent; it was noticeably cloudy if the count passed 1,000.

(*b*) Cell Count: This ranged from no cells to 23,700, depending on how far the infection had advanced before lumbar puncture. The polymorphonuclear cells varied from 20 to 100 per cent. It is interesting to note that those patients who remained severely ill the longest had less than 60 per cent polymorphonuclear cells in the spinal fluid.

(*c*) Smear: Smears were positive for the meningococcus in only 38 out of 62 fluids studied. Some smears showed only a few extracellular organisms. Organisms were found occasionally in clear fluids with normal cell counts.

(*d*) Culture: Cultures of the spinal fluid were positive in only 29 out of 62 fluids of which cultures were taken.

There were positive spinal fluid cultures, however, in 17 cases, when no organisms could be found by smear and when the blood culture was negative.

(*e*) Spinal Fluid Sugar: Quantitative sugar determinations were done in 47 cases. Twenty-two were decreased, some below reading level.

(*f*) Globulin: The globulin was increased in 24 of 47 fluids examined.

3. *Typing of Recovered Organism* (57 cases).[1]—Type I, 54; type II A, 2; type X, 1.

Bacteriologic diagnosis may be made by smears or culture from the spinal fluid or by culture from the blood or purpuric skin lesions. We did not use the last mentioned method. If the organism is not recovered by one method it probably will be recovered by one of the others. As may be seen from our figures, smears from the spinal fluid or blood cultures were about equal in giving positive results; positive cultures from the spinal fluid were not quite so frequent. The organism was not recovered from 11 cases which were undoubtedly meningococcic infection, as shown by symptoms, petechiae, cloudy spinal fluids or all combined. As early treatment, once clinical diagnosis was established, was our purpose, no effort was made to establish positive bacteriologic diagnosis by delaying treatment.

The large number of clear spinal fluids is decidedly worthy of note, particularly those clear fluids from which organisms were recovered either by smear or by culture. A clear spinal fluid by no means rules out beginning meningitis due to the meningococcus.

1. Typing was done for us under the direction of Dr. J. Howard Mueller, professor of bacteriology and immunology at the Harvard Medical School.

TREATMENT

In no disease is prompt, energetic treatment more necessary. The aim should be to establish diagnosis and start treatment before meningitis has developed. This is possible in many cases. Without treatment, progression from a beginning septicemia, which in some cases produces so few symptoms that it can be easily overlooked, to a purulent meningitis with coma may be very rapid. With vigorous treatment before the meningococcus has invaded the meninges, or at the beginning of invasion, in ordinary cases there is rapid and spectacular cure. For these reasons it is a mistake to withhold treatment until a definite bacteriologic diagnosis has been made; if the clinical signs are those of early meningococcic infection (headache, vomiting, rash) treatment should be begun at once.

This schedule embodies our routine procedure:

1. Lumbar puncture, requesting white blood cell count, differential, smear, culture, sugar and globulin.

2. Blood culture, white blood cell count, differential.

3. Diagnosis of meningitis on finding of cloudy fluid or positive smear or both.

4. If patient appears clinically to have meningitis or meningococcic septicemia, start on intravenous therapy regardless of appearance of spinal fluid or laboratory reports. This should be done immediately after spinal tap and blood culture are done.

5. Treatment (this routine should be adhered to in detail): Sodium sulfadiazine 5 Gm. in 100 cc. of distilled water intravenously (2 ampules of each) followed by 1,000 cc. of 5 per cent dextrose in isotonic solution of sodium chloride. Eight hours later give 2.5 Gm. of sodium sulfadiazine intravenously and follow with 1,000 cc. of 5 per cent dextrose in isotonic solution of sodium chloride. Repeat eight hours later. In cases of stupor or in presence of nausea or vomiting, intravenous therapy to be continued every eight hours in the same manner. If condition is satisfactory, to be given eight hours after last intravenous dose, 1.5 Gm. by mouth and repeated every four hours. Then changed to 1.5 Gm. every six hours two days after temperature recedes.

6. If patient shows evidence of circulatory shock or failure, give 1,500 cc. of 5 per cent dextrose in isotonic solution of sodium chloride intravenously and 2 cc. of adrenal cortex extract by hypodermic as often as may be required and treat for shock. When pulse and blood pressure respond and stabilize, discontinue. Sodium chloride ⅓ teaspoon by mouth every four hours to be given in conjunction with foregoing treatment. Blood pressure every three hours.

7. Orders: Daily sulfonamide levels. Daily urinalysis. Intake 3,000 cc. or better (sulfadiazine); 1,500 cc. (sulfanilamide). Blood pressure daily for three days. Intake and output chart. In cases showing mild periodic temperature elevations during convalescence, a blood culture is to be taken three days after discontinuing sulfonamide drug and patient is to be held in ward until read three days later. Throat cultures to be taken on fifth day after admission and every third day until two negative cultures have been obtained.

8. Serum: To be used only in following conditions: (1) fulminating cases in conjunction with sulfonamide drugs; (2) intolerance to all sulfonamide drugs.

SULFONAMIDE DRUGS

Good results have been reported with all four sulfonamides. Sulfadiazine was used in all our cases and at the moment it seems to be the drug of choice.

METHOD OF ADMINISTRATION

It is commonly advised that oral administration be used as a routine, and intravenous only for those who are in coma or who cannot retain the drug by mouth. We do not agree with this and have treated all patients intravenously for the first twenty-four hours, with the exception of a few very mild cases of subacute or chronic meningococcemia. There are two reasons for this:

1. Most patients, while not vomiting continuously, will vomit occasionally and in this way lose one or two valuable doses in the first twenty-four hours, just at the time when they are in most need of the drug. Particularly in dealing with large numbers of patients it is very desirable to know that in the early stages each

TABLE 1.—*Sulfadiazine Blood Levels Taken at Varying Times After Initial 5 Gram Intravenous Dose*

Case No.	10 Minutes	2 Hours	6 Hours
1	13.2	11.2	11.0
2	17.5	14.9	11.6
3	13.8	8.8	8.4
4	Not taken	16.4	9.3
5	13.5	10.6	7.4
6	19.8	11.0	Not taken
7	21.0	13.2	13.3
8	15.6	12.1	8.7
9	25.9	13.4	11.3
10	12.6	9.1	22.1
11	14.6	12.4	10.4
12	9.2	11.7	7.3

one has received into his blood stream a large amount of the drug and that there is no guesswork about it.

2. When sulfadiazine is absorbed quickly by the intravenous method of administration, a high blood concentration is reached at once in all instances irrespective of individual variations in absorption. It has been said that sulfadiazine is so rapidly excreted that a more constant level is maintained by oral than by intravenous administration. This may to a certain extent be true but is unimportant from a practical point of view if the intervals between intravenous doses are not too long. A twelve hour interval is commonly recommended. We thought this interval too long and felt that if it was used the blood concentration before the next dose would be too low. We therefore adopted an eight hour interval as routine. Table 1 shows the blood concentration of sulfadiazine at ten minute, two hour and six hour intervals after the initial 5 Gm. dose. In severe cases, in which it is very desirable to be sure that a continuous high level is maintained during the first twenty-four hours of treatment, it is our practice to determine the blood level four hours after the initial dose and, if it is not high enough, to give the next dose immediately instead of waiting the usual eight hours. This is rarely necessary.

TABLE 2.—*Blood Concentration of Sulfadiazine After Second Dose*

Case No.	Blood Level	Time After Administration
1	13.5	8 hours
2	Below reading	8 hours
3	13.9	6 hours
4	12.9	7 hours
5	14.8	7 hours
6	11.0	8 hours
7	11.3	8 hours
8	11.4	6 hours
9	8.1	8 hours

It may be seen from the table that there is after a 5 Gm. intravenous dose an initial high level, but not perhaps as high as one would expect after such a large dose. As sulfadiazine is rapidly excreted, the blood level diminishes after a few hours but not rapidly enough to be of practical importance. We feel that an initial high blood concentration, even if it is of comparatively short duration, is of distinct benefit. The blood level keeps up well after the second intravenous dose (2.5 Gm.).

Optimum Blood Concentration.—We do not know what the optimum blood concentration is but do not like to see it fall below 8 mg. per hundred cubic centimeters. Table 3 shows what the daily blood concentrations of 10 average cases were while on mouth therapy after the initial three intravenous doses. The oral dose used to attain these levels was 1.5 Gm. every four hours (9 Gm. daily). One Gm. every four hours is not enough to maintain what we consider an adequate blood level. We determined spinal fluid levels on no patients, as we do not believe this is necessary or desirable if a reasonably high blood level is maintained.

As may be seen, there is considerable variation in these levels. They were taken at varying times from the last dose of drug and it seemed likely that this was an important cause of the variation. In an attempt to settle this point, for some time we had the technician who took the blood note on the laboratory slip the time elapsed since the last dose of drug. There was no constant relationship: there were many high levels as long as eight hours after the last dose, low levels when the drug had been given only two or three hours previously. It seems likely that individual variation in rapidity of excretion, possibly associated with the amount of fluid intake, is more important. It has seemed to us that the level is likely to be lower during the acute stages of the disease, when meningococci are

TABLE 3.—*Blood Levels in Ten Average Cases While on Oral Therapy*

Case					
1	12.7	11.3	9.9	9.7	9.7
2	6.1	12.4	11.4	8.3	9.3
3	8.0	8.8	10.7	8.8	7.7
4	9.2	10.3	19.0	12.7	12.8
5	12.9	12.7	13.3	11.0	10.0
6	13.3	14.8	11.2	11.3	7.1
7	11.6	8.3	12.8	14.4	15.6
8	11.9	11.6	15.0	9.6	10.8
9	12.9	9.3	9.1	12.0	10.5
10	11.2	15.9	9.5	8.3	8.8

present in the blood and spinal fluid, than in the later stages, when they are not.

The duration of drug treatment averaged about eleven days; the total amount of drug taken was between 60 and 70 Gm. In most cases the temperature came down to normal in about three days. Two days after the temperature became normal the dosage of sulfadiazine was reduced to 1.5 Gm. every six hours. Treatment was continued for a week after the temperature had become normal. In only a few cases were second lumbar punctures done; the criterion of cure was the condition of the patient.

SULFADIAZINE REACTIONS

Eight patients had microscopic hematuria, 7 macroscopic hematuria, 3 drug fever, 4 renal colic, 1 a skin eruption. These reactions were not serious and were of short duration. When there was macroscopic hematuria we changed to sulfanilamide.

SERUM

It is our belief that, with the possible exceptions that have been noted, serum has now little place in the treatment of meningococcic infection. None of our patients received it.

FLUID INTAKE

It is common knowledge that with sulfadiazine therapy a high fluid intake is of the utmost importance. Immediately following each of the three intravenous doses of sulfadiazine which were given in the first twenty-four

hours, 1,000 cc. of 5 per cent dextrose in saline solution was given intravenously. Thereafter, during oral treatment, the daily fluid intake was kept at 3,000 cc. or over and intake and output were noted on a special chart attached to the wall.

SYMPTOMATIC TREATMENT

Headache is the chief symptom which needs attention and during the first few days may be very severe. It should be treated with morphine; codeine, acetylsalicylic acid or ice bags are of little avail.

CIRCULATORY COLLAPSE

Three patients had extreme circulatory collapse, and these are of such interest that detailed reports will be given:

CASE 1.—A. C., admitted at about 10 a. m. on Feb. 27, 1943, had an extensive purpuric rash, a temperature of 105.6 F. and was in coma. His spinal fluid was clear, had a cell count of 3, sugar 86 mg. per hundred cubic centimeters, no increase of globulin, no organisms found on smear. His blood culture (reported later) showed a heavy growth of meningococci. He was given the usual initial treatment. In the afternoon it appeared that he was not doing well. His respiration was labored and there were more purpuric spots. His pulse was very weak, his blood pressure 70/60 in the beginning of the afternoon, and finally was so low that it could not be taken. He was given more intravenous sulfadiazine and dextrose and saline solution, following which his pulse became somewhat better but soon was imperceptible again. He was then given 2 cc. of adrenal cortex extract subcutaneously. In a short time the pulse could be obtained and the blood pressure, which could not be taken before, rose to 50 systolic. He was given several more doses of extract and the blood pressure gradually rose until the next day it was 105/70. He was given two more doses of adrenal cortex extract at twelve hour intervals, ⅓ teaspoon of common salt by mouth every four hours, and the intravenous sulfadiazine was continued. He made an uneventful recovery.

CASE 2.—R. S., who was admitted on March 4, 1943, was obviously a very sick man, although his temperature was only 100 F. He was an ashen gray; he had moderate numbers of small skin petechiae; his pulse and blood pressure were unobtainable. His mentality, however, was clear and alert. His spinal fluid was clear, with a cell count of 7, sugar 102 mg. per hundred cubic centimeters, no increase of globulin and no organisms. Cultures of the spinal fluid and blood (reported later) yielded meningococci. He was treated in the same way as patient 1 and made an uneventful recovery.

CASE 3 (similar to case 1).

These men were in a state closely resembling surgical shock. They were treated with adrenal cortex extract, salt and dextrose on the theory that they had temporary adrenal failure, which is not uncommon in severe infections. There is no proof that this was so. However, the treatment worked. There is no reason for believing that they had the Waterhouse-Friderichsen syndrome with adrenal hemorrhage, which can be diagnosed with certainty only at autopsy. If there had been adrenal hemorrhage, it does not seem likely that the presumed adrenal insufficiency could have been corrected so quickly.

We regret that we did not obtain blood sugar and chloride determinations. If we have any more such cases we intend to use blood plasma.

MORTALITY

In the reported series of 68 consecutive cases of meningococcic infection extending from Jan. 1, 1943 to April 15, 1943 there was no mortality.[2]

2. Since this was written there have been 37 additional cases, making a total of 105 with no mortality.

SUMMARY AND CONCLUSIONS

1. It is possible to diagnose early meningococcic infection with reasonable accuracy in a high proportion of cases by clinical means alone.
2. The four cardinal signs and symptoms are headache, vomiting, chill and rash.
3. Early treatment is of the utmost importance. It should be begun without waiting for bacteriologic diagnosis.
4. Of 62 cases in which spinal puncture was done, the spinal fluid was clear in 31. Organisms were frequently recovered from clear fluids.
5. Thirteen of 68 patients had meningococcemia only, with no meningitis.
6. Positive blood cultures were obtained in 40 of 68 cases.
7. In 11 undoubted cases the organism could not be recovered either from the blood or from the spinal fluid.
8. Intravenous treatment with sulfadiazine as a routine is recommended for the first twenty-four hours.
9. In 68 consecutive cases the mortality was zero.

REFRIGERATION ANESTHESIA IN AMPUTATIONS

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This paper comprises a critical analysis of the literature on refrigeration anesthesia for amputations based on personal experience. To the 101 cases reported by Allen, Crossman and others [1] we add observations on 17 cases of our own, eight amputations for peripheral vascular disease and nine amputations for trauma.

What is meant by "refrigeration"? It is the chilling of tissues. It is not freezing. Freezing damages tissues as in frostbite; refrigeration does not. Water freezes at 0 C. (32 F.). Blood and tissues freeze at a slightly lower level. Refrigerating a limb with cracked ice or ice water lowers the temperature to somewhere between 0.5 and 5 above freezing. With a mechanical device the exact degree of refrigeration may be controlled. Hence there is a definite margin of safety. In no instance have we seen the tissues damaged.

In an effort to determine the exact temperatures deep in the tissues in various locations of the refrigerated extremity, with and without the use of a tourniquet, internal temperature measurements have been made in two most recent amputation cases. Dr. S. L. Osborn of the Physiology Department of the Northwestern University Medical School made these readings with an L. & N. potentiometer, hypodermic type No. 1, Thermocouple:

CASE 1.—Lower extremity refrigerated from the middle of the thigh to the toes for two and one-half weeks because of gangrene the result of crushing injury to femoral artery. At

Read before the Chicago Surgical Society in February 1943 and the Minneapolis Surgical Society in May 1943.

1. Allen, F. M.; Crossman, L. W.; Hurley, Vincent; Warden, C. E., and Ruggiero, W. F.: Refrigeration Anesthesia, J. Internat. College of Surgeons **5**: 125 (March-April) 1942. Crossman, L. W.; Allen, F. M.; Hurley, Vincent; Ruggiero, W. F., and Warden, C. E.: Refrigeration Anesthesia, Anesth. & Analg. **21**: 241-254 (Sept.-Oct.) 1942. Parker, G. R.: General Anesthesia by Cooling, Proc. Soc. Exper. Biol. & Med. **42**: 186 (Oct.) 1939. Tynes, A. L.; Nichol, W. W., and Wiggin, S. C.: Anesthesia for Military Needs, War Med. **1**: 789 (Nov.) 1941. Rupp, N. H.: Modern Concepts of Refrigeration Anesthesia, Anesth. & Analg. **22**: 46 (Jan.-Feb.) 1943. Mock, H. E., Jr.: Refrigeration Anesthesia for Skin Grafting, J. A. M. A. **122**: 597-598 (June 26) 1943.

the end of this period a tourniquet was applied about the middle of the thigh and the entire extremity then refrigerated with cracked ice for two and one-half hours followed by amputation.

Internal temperature measurements after two and one-half weeks of refrigeration with ice bags without tourniquet and similar measurements after two hours of refrigeration with cracked ice with tourniquet are shown in table 1.

TABLE 1.—*Temperatures in Case 1*

Region Measured	Millivolts	Temperature, F.
Refrigeration without tourniquet for 2½ weeks:		
Medial aspect of lower ⅓ of thigh, 3 inches deep	0.540	34.3
External surface of lower ⅓ of lower leg, 1 inch deep	0.109	32.7
Medial aspect of mid lower leg, 2 inches deep	0.161	32.7
Refrigeration with tourniquet for 2 hours:		
Medial aspect of lower thigh, 3 inches deep	0.231	33.0
Lateral aspect of lower thigh, 3 inches deep	0.334	33.5

CASE 2.—Arteriosclerotic gangrene of foot and ankle with infection with lower leg refrigerated for seventy-two hours by means of ice bags without tourniquet followed by refrigeration with cracked ice for two and one-half hours with tourniquet placed about the lower third of the thigh, followed by amputation just above the condyles. Temperature measurements were made at the end of forty-eight hours and again two hours later after application of tourniquet and refrigeration with cracked ice. Table 2 shows these temperature measurements.

How does lowering the temperature to this level produce anesthesia? It does so by stopping cellular metabolic processes. It puts the cells at absolute rest in a manner comparable to hibernation. Inactive cells will not respond to stimuli. Prior to the introduction of this method, all anesthetics in common use were nerve anesthetics. Refrigeration anesthesia acts on all tissues. It produces an anesthesia of protoplasm.

The use of reduced temperatures has long been known, but it was not until the past decade that refrigeration has been used for anesthesia. About twelve years ago Frederick Allen [2] of New York, seeking an experimental approach to the problem of diabetic gangrene, approximated conditions of inadequate circulation by depriving tissues of all blood supply with a tourniquet. The essential finding in this work was that changes in tissue metabolism by lowered temperatures prolonged the survival period from minutes or a few hours at elevated temperatures to as long as fifty-four hours at a temperature near freezing. Brooks and Duncan [3] showed that the survival period of constricted rat tails at low temperatures was above ninety-six hours. Temple Fay and his co-workers [4] brought out some astounding physiologic facts regarding local and general refrigeration of the body in the treatment of malignancy and infection. They also must be credited with the early development of mechanical means of applying refrigeration.

As an outgrowth of these experimental studies, Frederick Allen interested a group of surgeons at the New York City Hospital to apply refrigeration clinically in cases of peripheral vascular disease, with or without diabetes, requiring amputation because of gangrene. This hospital was an ideal one for such a study because it was the dumping ground for all the other city hospitals, receiving many of the elderly, chronically ill, patients that would fall into this treatment group. Crossman, Ruggiero, Hurley, and Allen [5] analyzed their results in 101 amputations with refrigeration anesthesia. The mortality rate in this series was 15 per cent. McKittrick states that the mortality rate in amputation for diabetic gangrene ranges from 13 per cent to 80 per cent. Considering only the diabetic cases in the Crossman series, 10 deaths out of 47 patients with an average age of 65 years, the mortality rate rises to 21 per cent. For these men to approach the lower mortality figure, using unselected cases from an exceedingly poor risk group, is noteworthy. It speaks well for their ability and for the methods used.

In our 8 cases of amputation for peripheral vascular disease there were two deaths:

The first of these patients, a white man aged 78 with diabetes, had an amputation below the knee under refrigeration anesthesia for extensive gangrene of the foot and lower third of the leg. Gas gangrene developed in the stump but was controlled with refrigeration, x-rays, gas bacillus antiserum and sulfonamide drugs. A week later the leg was reamputated above the knee. The stump was healing and it was felt that the patient was recovering when, on the eighth postoperative day, he died suddenly of an acute coronary thrombosis. Autopsy confirmed the cause of death.

The second death was that of a man aged 76 on whom we had performed a low thigh amputation of the left gangrenous leg under refrigeration anesthesia six months previously. The gangrene was due to a pronounced arteriosclerosis which involved the right lower extremity to a lesser degree. At that time the threatened gangrene in the right foot cleared up under a short period of partial refrigeration (chilling) and the use of antispasmodics. At the end of six months the patient returned to the hospital with his right foot gangrenous and infected. His temperature was 102 F. He was in very poor condition. This leg was refrigerated without a tourniquet for three days. During that period he was given a blood transfusion, and efforts otherwise were made to improve his condition. The patient consented to an amputation "if we would freeze it and give him some whisky." A low thigh amputation was done under refrigeration anesthesia. Twenty-four hours later gas bacillus infection developed in the stump.

TABLE 2.—*Temperatures in Case 2*

Region Measured	Millivolts	Temperature, F.
Refrigeration without tourniquet for 3 days:		
Medial aspect upper ⅓ calf, 3 inches deep	0.073	32.3
Lateral, as above, 3 inches deep	0.087	32.5
Lateral aspect 3 inches above malleolus, 2 inches deep	0.071	32.3
Medial aspect of middle of leg, 2 inches deep	0.082	32.3
Refrigeration with tourniquet for 2 hours:		
Medial aspect upper ⅓ calf, 3 inches deep	0.022	32.1
Lateral aspect calf, 2 inches deep	0.021	32.1
Medial aspect lower ⅓ of leg, 2 inches deep	0.009	32.0
Lateral aspect 3 inches above malleolus, 2 inches deep	0.018	32.0

This was treated in the same manner as the infection in the first fatal case. The local gas bacillus infection subsided but the patient developed multiple infected thrombi with small areas of gangrene on his penis, scrotum, left hip and back. He died apparently from sepsis sixteen days after amputation. Autopsy was not obtained.

We have had no deaths in the amputations for trauma.

2. Allen, F. M.: The Tourniquet and Local Asphyxia, Am. J. Surg. **41**: 192-200 (Aug.) 1938; Experiments Concerning Ligation and Refrigeration in Relation to Local Intoxication and Infection, Surg., Gynec. & Obst. **68**: 1047 (June) 1939; Surgical Consideration of Temperature in Ligated Limbs, Am. J. Surg. **45**: 459 (Sept.) 1939; Reduced Temperatures in Surgery: I. Surgery of Limbs, ibid. **52**: 225 (May) 1941; Reduced Temperatures in Surgery: III. Experiments on Pelvic and Abdominal Refrigeration with Especial Reference to Traumatic and Military Surgery, ibid. **55**: 451 (March) 1942; Refrigeration Anesthesia for Limb Operations, Anesthesiology **4**: 12-16 (Jan.) 1943.

3. Brooks, Barney, and Duncan, G. W.: Effects of Temperature on Survival of Anemic Tissue, Ann. Surg. **112**: 130-137 (July) 1940.

4. Fay, Temple, and Henry, G. C.: Correlation of Body Segmental Temperature and Its Relation to the Location of Carcinomatous Metastases, Surg., Gynec. & Obst. **66**: 512-524 (Feb., No. 2A) 1938.

5. Crossman, L. W.; Ruggiero, W. F.; Hurley, Vincent, and Allen, F. M.: Reduced Temperatures in Surgery: II. Amputation for Peripheral Vascular Disease, Arch. Surg. **44**: 139 (Jan.) 1942.

The senior author's interest in this method was aroused in June 1940 at a conference of the Committee on Amputations of the Council on Physical Therapy of the American Medical Association with Drs. Allen, Crossman and Ruggiero, in which the latter three gave a complete report of their methods and results. Immediately after this conference he visited these men in New York and observed their cases and witnessed an amputation under refrigeration anesthesia. The same summer the junior author spent some time with them, studying their clinical and experimental work. They allowed him to assist at one amputation to learn their technic. We used refrigeration anesthesia for several amputations but we were still looking for the badly traumatized extremity to treat in this manner when the report of McElvenny's[6] outstanding case of bilateral high thigh traumatic amputation was published. A more classic illustration of the value of this treatment as applied to trauma could not be found.

The first step in producing refrigeration anesthesia is the application of a tourniquet. Without it the circulating blood in the extremity would prevent complete refrigeration. The use of a tourniquet is one of the great controversies in medicine. Most objections center about three points: the local asphyxia of the tissues distal to the tourniquet, the damage to the tissues compressed by the tourniquet and the shock produced by the release of the tourniquet.

While there has been insufficient investigation to establish or refute these objections definitely, animal experiments show that bloodless extremities can survive twelve to fifteen hours at room temperature without necrosis. Crossman, Allen and their co-workers report one badly ulcerated human leg that had a tourniquet applied for six hours without apparent damage. Several days later this leg was amputated and pathologic examination likewise failed to demonstrate any damage from the six hours of asphyxia. Direct pressure does injure tissues. The amount of damage depends on the tension, the elasticity and the width of the tourniquet. Naturally only sufficient tension should be applied to stop the flow of blood. Elastic materials are less harmful than cords or other materials that will not expand. Except in the arm, where there are many nerves without much tissue padding, a narrow zone of constriction is preferable. Serious systemic shock can be produced by the release of a tourniquet that has rendered large masses of tissue bloodless for a long time. The histotoxins that form in asphyxiated tissues during the usual time a tourniquet is in place are insufficient to do this. Badly traumatized tissues that have impaired local resistance are an exception. Here a tourniquet must be used guardedly unless it is in conjunction with refrigeration. Reduced temperatures obviate all the objections to tourniquets because the compressed or asphyxiated cells are at rest and not throwing off waste products.

During the early days of refrigeration the tourniquet was applied 4 to 6 inches above the site of election even in leg amputations. Now there is no hesitation whatever in placing the tourniquet about the thigh, where complete control of bleeding can be obtained. This level may be as much as 18 inches above the site of amputation. No detrimental effects will be observed in the stump if the refrigeration has been carried 3 to 4 inches above the tourniquet. Refrigeration above the site of the tourniquet is imperative.

6. McElvenny, R. Y.: The Effect of Cooling Traumatized and Potentially Infected Limbs, Surg., Gynec. & Obst. **73**: 263 (Aug.) 1941.

There are four generally accepted measures for producing refrigeration: immersion in ice water, applying pure gum rubber ice bags, packing in cracked ice and mechanical means. The first two are limited in their use and therefore not entirely satisfactory. Mechanical methods are no doubt the best because of cleanliness, ease of application, more rapid refrigeration and maintenance of desired temperature level with thermostatic control. However, their cost is prohibitive to the average surgeon, who would rarely have occasion to use it. All our patients were refrigerated with cracked ice; first, because we did not wish to invest in a machine until we were satisfied with the method, and later because we decided to continue with this type of refrigeration in order to establish its feasibility for the surgeon with the occasional case.

Our experience has corroborated Allen's findings as regards the condition of the tissues seen in stumps of legs amputated under refrigeration anesthesia. The skin is blanched but fresh. The muscles are bright red and have a fresh appearance. The blood vessels are wide open, and when the tourniquet is removed fresh red blood flows freely from them, indicating the absence of all thrombosis. As stated by Allen and as observed by all of us who have used this method, the tissues have the appearance of a leg of beef which has hung in a refrigerator for days.

The length of time required for complete through and through anesthesia depends on the depth of the tissues. An emaciated shin may require only one hour, while a thick thigh may require as long as five hours. There is no test to determine this. Using the foregoing range as a rough measuring rod, we have refrigerated most of our patients two and one-half to three hours and obtained excellent anesthesia. On almost every occasion the sciatic nerve has been picked up, crushed with an artery forceps, pulled down, injected with alcohol, and then cut without the patient showing the least change in pulse, blood pressure or respiration and without uttering the least complaint of pain. It is hard to believe this statement unless one has actually seen it happen.

On the patient's return from the operating room, his first request is usually for food, although one patient immediately phoned his brother, kidding him about the simplicity of losing a leg. This is offered as evidence that the operation was not an ordeal, that there was no shock and that there was no pain. This complete absence of shock is of great value in any event but particularly in elderly debilitated patients who might not otherwise survive an operation or in severely traumatized patients when avoidance of additional shock is imperative.

Frequently diabetic or arteriosclerotic patients are so debilitated or so weakened by sepsis that they are poor operative risks. Many of them sorely in need of amputation are allowed to die because experience and judgment tell us that they could not possibly survive an operation. Others of them are so badly infected that their lives can be saved only by ridding them of the infected member. In these cases it has been our practice in the past to do a quick guillotine amputation in the calf, intending, if the patient survives, to do a finished amputation above the knee. Many of these stumps become infected, frequently with the gas bacillus. In spite of all treatment the patient too often goes into diabetic coma or develops a generalized sepsis and dies. It is in such cases that the tourniquet and refrigeration are particularly valuable. The tourniquet stops absorp-

tion, while refrigeration inhibits cellular metabolism and retards bacterial action. Preoperative treatment is then of some benefit. A finished amputation at a site of election can then be done without much fear of stump infection. The absence of shock gives the patient a better fighting chance.

If the infection is very severe and threatening the life of the patient, the tourniquet may be placed above the site of infection and the part refrigerated for hours or even days. Later, when the patient's condition is improved to the point of standing an amputation, a second tourniquet may be applied about the thigh and refrigeration carried this high for two and one-half or more hours and the extremity removed. If this technic is carried out, the first tourniquet must never be removed.

In badly crushed extremities, shock often of an extreme degree is present as the result of hemorrhage and absorption of histotoxins from the crushed tissues. When a limb is so crushed that amputation is inevitable, we advise the immediate application of a tourniquet and the packing of that limb in ice. This checks the shock and retards bacterial growth. It permits the surgeon a few hours to give the patient a transfusion and otherwise prepare him for amputation. Finally the amputation can be done without shock and without any other anesthetic agent whatever.

There are many cases of early gangrene of the toes or a part of the foot due to peripheral vascular disease, especially among diabetic patients, in which a high amputation seems entirely too radical to the patient or to his relatives and consent is refused. Partial refrigeration of such an extremity, that is, chilling it by surrounding it with ice bags without the use of a tourniquet, is of proved therapeutic value. The metabolism in the extremity is retarded to the point that the gangrene may be checked and collateral circulation may have time to become established. If infection is present this partial refrigeration inhibits bacterial growth, thus eliminating the spread of the infection. This method, especially when combined with the treatment of the peripheral vascular disease and the control of the diabetes if present, may prove of the greatest value in limiting many amputations to the local area of gangrene or at least to the lower extremity instead of the routine thigh amputation as practiced by the majority.

We have had 1 case, and the senior author in consultation with Dr. E. H. Tannehill has had a second case in which gangrene developed in the lower extremity following severe fractures of the pelvis with obliteration of the iliac or femoral vessels. The first patient was seen nine days after the injury, and the second twenty-eight hours afterward. Partial refrigeration was applied at once. In the first case amputation seemed inevitable near the hip. However, the entire process was held in abeyance in this lower extremity by packing it in ice bags, thus giving time for development of the collateral circulation. The refrigeration process was maintained for two weeks. With the development of collateral circulation it seemed for a time that the gangrene might be localized just above the ankle. Amputation was performed under refrigeration anesthesia 6 inches below the knee. The soft tissues were fresh and healthy except for the gastrocnemius muscle, which had a few areas resembling spoiled beef. A secondary gangrene developed in the posterior portion of the stump, which again was partially refrigerated for one week and then a second amputation was done just above the knee. We all felt that the holding of the gangrenous process in abeyance allowed sufficient collateral circulation to form to prevent a high thigh amputation. In the second case the partial refrigeration of the entire lower extremity prevented the development of the typical black moist gangrene, so frequently fatal without early amputation, in an extremity deprived of all circulation by damage to the iliac and femoral vessels. This partial refrigeration was maintained for two and one-half weeks, during which time this patient recovered from a cerebral concussion, a severe chest injury, a ruptured urethra, an infected large hematoma of the left buttock and thigh and a very serious pneumonia. He was in an oxygen tent for ten days. It was our firm conviction that at no time during the first two weeks was this patient in condition to stand a thigh amputation. Furthermore, because of the loss of circulation in the right lower extremity, such a serious gangrene would have developed if the part had been left at room temperature or if hot applications had been applied, that an earlier amputation would have been imperative. Because of the refrigeration, this extremity at operation resembled a fresh leg of beef hung in a refrigerator. The line of demarcation of the gangrene developed at the junction of the lower and middle thirds of the thigh and was indicated by a slightly bluish pallor at this level. Following a midthigh amputation under refrigeration anesthesia two and one-half weeks after injury, the stump healed and the patient recovered in spite of a serious empyema which ruptured into a bronchus ten days after the amputation, necessitating a tracheotomy when the patient almost drowned in his own pus, and in spite of a rib resection to drain the empyema cavity. No case has so impressed us with the value of partial refrigeration followed by refrigeration anesthesia for the amputation.

TECHNIC

The technic of refrigeration anesthesia is essentially the same in all types of cases. One hour before anesthesia is started, ice bags are closely approximated to the skin at the level at which the tourniquet is to be applied. Care must be taken to have these ice bags in continuous contact with the skin, leaving no gaps between the bags. They should be applied with pressure, so it is preferable to bandage them to the leg. This procedure "numbs" the area and permits the tourniquet to be applied with a minimum of discomfort. The leg is first drained of blood by elevation and then the tourniquet is applied sufficiently tight to restrict the blood flow but not so tight as to cut into the skin or damage soft tissues. We use a length of soft rubber tube which is wrapped around the thigh twice and held firmly by two long stomach clamps. The handles of these clamps lie along the hip, thus allowing easy removal of the tourniquet later without disturbing the sterile field. After the tourniquet is applied, a rubber sheet is tied around the leg or thigh 3 to 4 inches above the level of the tourniquet. The rubber sheet extends from this level down beyond the foot. Recently we have been using a narrow inverted cradle to form a bin to support this sheet. The rubber trough is then filled with cracked ice, which is packed completely around the extremity. Three buckets of cracked ice are usually sufficient to obtain refrigeration for the amputation. The head of the patient's bed should be elevated on shock blocks so that the water that collects from the melting ice can be drained off at the foot of the bed rather than forming a pool under the patient. The

patient should be watched constantly to see that all parts of the leg are covered with ice the entire time, more ice being added as required.

Usually we give the patient a drink of whisky at the start of the refrigeration and may repeat it at the end of one and a half hours. This greatly helps to allay the apprehension that accompanies any amputation. A few of the patients have complained of pain from the tourniquet and, although this is rare, it may be necessary in such cases to give a hypodermic of morphine.

At the end of the time allotted for refrigeration, which depends on the thickness of the part being refrigerated, the patient is taken to the operating room with the leg still packed in ice. Refrigeration anesthesia will last approximately one hour, so the ice is not removed until the last possible moment. After the surgeon is scrubbed, the ice is removed by the nurse. During operation sponges should be soaked in cold saline solution rather than in the customary warm solution so as not to raise the temperature too quickly. For the same reason the operating lights are not turned on until the surgeon is ready to start the operation.

From this point on the amputation is carried out according to standard procedure. Although the original workers stated a definite preference for either an amputation in the lower third of the leg or a modified Callander supracondylar amputation in the thigh, both of which avoid large masses of muscle, we have also performed other types of amputations with equally satisfactory results. A minimum of operative trauma is the essential need here as in any surgical procedure. After all the large blood vessels have been ligated and the nerves treated, the tourniquet is released and further bleeding controlled. A tight closure of the stump is then made, although a small drain may be inserted if desired.

Allen and Crossman advocated the application of ice bags to the stump postoperatively. Ordinarily three ice bags were put on and one was removed each day thereafter. They served a dual purpose: first, to lower the metabolic requirements of the stump until collateral circulation developed and, second, to inhibit bacterial growth until the stump was better able to take care of any infection that might be present. Chilling the stump also inhibits healing just as long as it is continued. The cut surfaces do not become agglutinated. Instead they weep serum, the drainage of which has a certain irrigating action. Whenever a severe infection exists in the amputated part, postoperative chilling of the stump is indicated. In our experience, however, using it in a clean case merely prolongs the healing time. With this step omitted, stumps amputated under refrigeration anesthesia heal at essentially the same rate as those amputated under spinal or inhalation anesthesia.

SUMMARY

In our experience a slight delay in healing has been the only disadvantage encountered when refrigeration anesthesia is used for amputations. Its advantages are many to overcome this objection. Postoperatively there is no pain: none of our patients have required an analgesic. There is no shock or other reaction to what is commonly considered a rather shocking operation: the blood pressure, pulse and respirations show no change during or after the operation. It permits surgery to be performed in what formerly were hopeless cases because of debility or septicemia. It lowers the incidence of stump infections in those limbs requiring amputation because of infection. It is of especially great value for diabetic patients when the absence of any postoperative reaction allows the patient to carry on without missing a meal. The diet and insulin dosage do not have to be juggled.

In severe crushing injuries of an extremity or other injuries with complications necessitating amputation, refrigeration will inhibit infection and limit the absorption of histotoxins, thus helping to overcome shock, and will give time for infusions of plasma, blood or fluids and other necessary preparatory measures. With refrigeration the amputation may be delayed until life threatening associated injuries or complications have been conquered. Finally, under refrigeration anesthesia the extremity may be amputated at the selected site without further shocking the patient.

122 South Michigan Avenue.

SULFATHIAZOLE ERUPTIONS

SENSITIVITY INDUCED BY LOCAL THERAPY AND ELICITED BY ORAL MEDICATION

REPORT OF FOUR CASES WITH SOME ALLERGIC STUDIES

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Local sulfathiazole therapy is now a well established procedure in the treatment of superficial pyogenic disorders of the skin.[1] Most authors considered this to be a relatively innocuous type of treatment, but experience has indicated that unfavorable reactions, some of them quite severe, may occur.[2] This report details the types of reactions which have been described following local sulfathiazole therapy and also includes an account of 4 cases with allergic studies comprising our experiences with some of the more spectacular types of reactivity.

Sams and Capland [2] reported an example of recurrent contact dermatitis following repeated applications of sulfathiazole powder to the ears for a recurrent chronic dermatitis. Subsequent oral administration of the drug precipitated a severe dermatitis of the ears, followed shortly by a widely disseminate eruption. A patch test with the sulfathiazole powder gave negative results.

Miller [2] lists 5 cases of contact dermatitis due to sulfathiazole. Two of these followed the application of a 50 per cent sulfathiazole ointment. They began as local papulovesicular eruptions which within one week spread to involve much of the cutaneous surface. One of the patients was given a patch test with the ointment,

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1. Lain, E. S.: Sulfanilamide in Glycerin in Local Treatment for Pyodermias, Arch. Dermat. & Syph. **44:** 257-258 (Aug.) 1941. Hrad, O.: Chemotherapy of Infectious Diseases of Skin, Dermat. Wchnschr. **112:** 190-194 (March 8) 1941. Pillsbury, D. M.; Wammock, V. S.; Livingood, C. S., and Nichols, A. C.: The Local Treatment of Pyogenic Cutaneous Infections with Sulfathiazole in an Emulsion Base, Am. J. M. Sc. **202:** 808-822 (Dec.) 1941. Steigman, A. J.: Sulfathiazole Ointment in the Treatment of Impetigo, Brit. M. J. **1:** 12-13 (Jan. 3) 1942. Winer, L. H., and Strakosch, E. A.: The Value of Sulfathiazole Ointment in the Treatment of Pyogenic Infections of the Skin, J. A. M. A. **118:** 221 (Jan. 17) 1942. Shaffer, Bertram: The Use of the Sulfonamides in Dermatology, Connecticut M. J., to be published. Sams and Capland.[2] Miller.[2] Keeney, Pembroke, Chatard and Zeigler.[11] The Robinsons.[2]

2. Sams, W. M., and Capland, Lewis: Topical Treatment with Sulfathiazole, Arch. Dermat. & Syph. **44:** 226-230 (Aug.) 1941. Miller, J. L.: The Use of Sulfanilamide and Its Derivatives in Ointment Form: Local Treatment of Cutaneous Disease, ibid. **46:** 379-385 (Sept.) 1942. Robinson, H. M., and Robinson, H. M., Jr.: Local Use of Sulfathiazole in Dermatoses, South. M. J. **34:** 1093-1096 (Nov.) 1941.

but the result was negative. The other patient, two months later, was given 0.5 Gm. (1 tablet) of sulfathiazole. A generalized eruption again appeared, but it began and was most severe at the site of the original application of the drug. Two other patients using 10 per cent sulfathiazole ointment suffered mild local dermatitis and another patient experienced a generalized scarlatiniform eruption without a local manifestation. All these cases were proved by a recurrence of the eruption when the sulfathiazole application was repeated.

The Robinsons [2] mentioned 2 cases of contact dermatitis following the local application of sulfathiazole but gave no details.

Livingood and Pillsbury [3] collected an interesting group of 12 cases all of which featured a widely disseminate eruption rapidly precipitated by the oral administration of small doses of sulfathiazole. This eruption began and was most severe at the sites of a preceding "sensitizing" application of sulfathiazole ointment. All these patients were treated originally for various types of dermatitis which were basically, in the opinion of the authors, allergic manifestations to various types of contactants but in which pyogenic infection played a secondary or subsidiary role.

Two cases of a nature similar to those of the aforementioned paper [3] were described by Cohen, Thomas and Kalisch.[4] In 1 of the cases there was a negative result to a patch test.

Weiner [5] described 4 cases of simple contact dermatitis due to sulfathiazole, all of which, however, were proved by patch testing.

Efforts to elucidate the allergic mechanisms in sulfonamide eruptions of the toxic or systemic variety, such as those which follow the usual oral administration of these drugs, have met with failure.[6] One would naturally expect this result, since similar attempts in cases of dermatitis medicamentosa due to other drugs have almost always been unsuccessful.[7]

These tests, in the case of the sulfonamides, have included the usual patch tests, scratch and intradermal tests, as well as passive transfer tests of the Prausnitz-Küstner type. Attempts to demonstrate specific sensitivity in human beings using sulfonamide azoprotein compounds have also failed,[8] although Wedum,[9] using antigenic groups of this nature, was able to transfer to and demonstrate sensitivity in guinea pigs. The latter apparently is similar to the experimental work of Rosenthal [10] with analogous types of phenolphthalein compounds.

Although the etiologic agent in most cases of allergic contact dermatitis is readily demonstrated by appropriate patch testing, this does not appear to be the case in the majority of reports mentioned of "contact dermatitis" due to sulfathiazole.

Most authors were not able to demonstrate the presence of sulfathiazole in the blood following local application. Keeney and his associates [11] were able to find small amounts of this drug in the blood stream in only a small number of cases of infantile eczema in which large portions of the cutaneous surface were treated.

REPORT OF CASES

CASE 1.—E. H., a housewife aged 28, white, on Nov. 5, 1941 presented on the right hand a chronic, scaling, fissured and patchy dermatitis localized to the palm and thenar eminence, and also an acute vesiculopapular dermatitis on the paronychial regions of several fingers. This condition had been present recurrently since an attack of "athlete's foot" four and one-half years before.

Appropriate clinical, laboratory, allergic and roentgenologic studies revealed no abnormalities or evidence of foci of infection. Scrapings and cultures for fungi were negative. Several bacteriologic studies of the skin showed consistently pure cultures of hemolytic Staphylococcus aureus.

For three weekly intervals the patient was treated with x-rays (63 roentgens), sulfathiazole 5 per cent in cholesterinated petrolatum and staphylococcus ambotoxoid.[12] The latter was injected intracutaneously in a dosage of 0.1 cc. of a 1 : 10 dilution. This resulted in tuberculin type reactions averaging 5 by 5 cm.

On the second week the eruption was a little worse, but when observed after the third week the process had became very acute and involved the left hand as well as the wrist on the right side.

All active treatment was stopped. The eruption showed gradual improvement, so that after two months (Jan. 27, 1942) it finally subsided to its original degree of activity.

Subsequent attempts to desensitize the patient to ambotoxoid in dilutions of 1 : 1,000 and later of 1 : 10,000 were each followed by increased activity of the process. After it was determined finally that a dilution of 1 : 20,000 could be well tolerated, increasing concentrations were injected. When the dilution of

Fig. 1 (case 1).—Acute dermatitis precipitated by the ingestion of sulfathiazole; primary sensitization appeared as an exacerbation of the patient's original eruption due to sulfathiazole.

1 : 2,500 was reached, however, a flare-up in the eruption appeared, so that after two such attempts ambotoxoid therapy was stopped permanently.

One week later sulfathiazole was prescribed for oral administration in a dosage of 1 Gm. every six hours. After the first dose the patient noticed stinging, burning, increased redness, tenseness and swelling of both hands. Following a second dose the condition became greatly aggravated (fig. 1). At the end

3. Livingood, C. S., and Pillsbury, D. M.: Sulfathiazole in Eczematous Pyoderma: Sensitization Reaction to Successive Local and Oral Therapy; Report of Twelve Cases, J. A. M. A. **121:** 406-408 (Feb. 6) 1943.

4. Cohen, M. H.; Thomas, H. B., and Kalisch, A. C.: Hypersensitivity Produced by the Topical Application of Sulfathiazole, J. A. M. A. **121:** 408-411 (Feb. 6) 1943.

5. Weiner, A. L.: Cutaneous Hypersensitivity to Topical Application of Sulfathiazole, J. A. M. A. **121:** 411-413 (Feb. 6) 1943.

6. Goodman, M. H., and Levy, C. S.: The Development of a Cutaneous Eruption (Toxicodermatosis), J. A. M. A. **109:** 1009-1011 (Sept. 25) 1937. Loveman, A. B., and Simon, F. A.: Fixed Eruption and Stomatitis Due to Sulfanilamide, Arch. Dermat. & Syph. **40:** 29-34 (July) 1939. Hageman and Blake.[8]

7. Abramowitz, E. W.: Cardinal Points in the Diagnosis of Drug Eruptions, M. Clin. North America **22:** 1323-1331 (Sept.) 1938. Shaffer, Bertram: Pemphigoid Eruption Associated with Hemorrhagic Nephritis Following Bismuth Therapy, Arch. Dermat. & Syph., to be published.

8. Hageman, P. O., and Blake, F. G.: A Specific Febrile Reaction to Sulfanilamide: Drug Fever, J. A. M. A. **109:** 642-646 (Aug. 28) 1937.

9. Wedum, A. G.: Immunologic Specificity of Sulfonamide Azoproteins, J. Infect. Dis. **70:** 173-179 (March-April) 1942.

10. Rosenthal, S. R.: The Conjugation of Haptens in Vivo; Phenolphthalein, J. Immunol. **34:** 251-267 (March) 1938.

11. Keeney, E. L.; Pembroke, R. H.; Chatard, F. E., and Zeigler, J. M.: Sulfathiazole Ointment in the Treatment of Cutaneous Infections, J. A. M. A. **117:** 1415-1417 (Oct. 25) 1941.

12. The proprietary name of this preparation is Staphylococcus Toxoid and Bacterial Antigen made from Staphylococci Combined (Squibb).

of twelve hours an intensely pruritic and widespread papular and urticarial eruption had appeared on the face, neck and upper extremities. Three days later the disseminate eruption had disappeared, but it took six weeks (May 5) for the local process on the hands to subside. Mistaking the sulfathiazole ointment

Fig. 2 (case 2).—Pemphigoid eruption following the oral administration of a single tablet (0.5 Gm.) of sulfathiazole. The patient's original allergic response to the drug followed its local application.

for another preparation, the patient applied this salve to her hands on May 5. Within twenty-four hours an explosive generalized eruption developed resembling, but much more severe than, the condition following the oral sulfathiazole. Approximately 40 per cent of the scalp hair was lost and vesicular and bullous lesions were present on the hands and feet. The eruption subsided only after four months of palliative treatment.

CASE 2.—W. W., a Negro youth aged 21, was treated recurrently from Aug. 2, 1938 to Sept. 3, 1940 for a relapsing, crusted, oozing, purulent eruption involving the scalp and ears. This condition was diagnosed as staphylodermia, and repeated studies showed pure cultures of hemolytic Staphylococcus aureus.

On Sept. 14, 1940 he was admitted to the University Hospital because a widespread vesiculopurulent eruption had developed. One week later he was given sulfanilamide orally (2.6 Gm. a day for six days). Because of inadequate response, sulfathiazole was then administered. After eight days on a dosage of 3 Gm. a day the eruption disappeared completely.

On October 24, three days after an initial injection of staphylococcus ambotoxoid, a violent vesiculopustular eruption appeared on the bearded region, scalp and ears. With high dilutions of the ambotoxoid attempts were made to desensitize the patient but with no beneficial effect.

On December 13 he was given an ointment containing 1 per cent sulfathiazole. The eruption became aggravated almost immediately, and within three days a generalized vesiculopustular and bullous eruption was present. As the basis of this eruption was not recognized and also because of his satisfactory response to sulfathiazole orally on his previous admission, this drug was again administered on Jan. 6, 1941 in a dosage of 0.5 Gm. every six hours. That day his temperature rose to 102.6 F. Four days later he complained of acute colicky pains in the upper part of the abdomen and nausea. Sulfathiazole was stopped. The symptoms disappeared within twenty-four hours and the temperature fell to normal the next day. The eruption slowly, over a period of three weeks, disappeared (February 3).

Because some activity was noted on the scalp a few days later he was given an ointment containing 5 per cent sulfathiazole. Again the process flared up and became more extensive.

On September 14 the patient visited a private physician, who gave him some sulfathiazole tablets. The abdominal symptoms, the rise of temperature and the generalized bullous eruption recurred within twenty-four hours. For a period of three months he was treated at another hospital before recovery ensued.

On Aug. 7, 1942 he was admitted to the University Hospital because a fairly widespread vesiculopurulent eruption had again developed.

The next day he was given a single tablet (0.5 Gm.) of sulfathiazole orally. Within one-half hour his temperature rose to 103 F., the abdominal pains appeared and a generalized papular and urticarial eruption was present. Twenty-four hours later many of these lesions had become bullous and hemorrhagic (fig. 2) and conjunctivitis, erosive stomatitis, gingivitis and pharyngitis were present. After one week improvement began. Four months later the eruption had disappeared and the patient was discharged. Repeated cultures of the lesions with rare exceptions were reported as pure growths of hemolytic Staphylococcus aureus.

CASE 3.—J. D., a white man aged 27, had an eruption on the hands in September 1927. This recurred in 1939. He presented himself to the clinic of the department of dermatology and syphilology on May 18, 1942 because two weeks previously the process had flared up once more, this time involving also the forearms.

Examination revealed an acute, diffuse, weeping dermatitis on the sites mentioned. This was diagnosed as contact dermatitis with secondary pyogenic infection. Treatment was started with an ointment consisting of sulfathiazole 6 per cent, ichthammol 3 per cent in zinc oxide ointment.

No improvement was noted two days later. Sulfathiazole orally, 1 Gm. every six hours, was prescribed and he was given an intracutaneous injection of staphylococcus ambotoxoid 0.1 cc.

Fig. 3 (case 3).—Widely disseminate eruption evoked by oral sulfathiazole medication. This eruption appeared five days after the original contact with sulfathiazole in the form of an ointment.

of a 1:1,000 dilution. A few hours after the first dose of sulfathiazole the eruption became somewhat more active. After three days of this medication it had become generally disseminated (fig. 3) and was associated with conjunctivitis and a temperature of 101.4 F.

Sulfathiazole was stopped. Two days later improvement began and within two weeks he was well (June 10).

CASE 4.—C. G., a white boy aged 16, on April 30, 1942 complained of a pustular type of acne vulgaris involving the face, back and upper part of the chest. He was treated over these regions by means of x-rays (50 roentgens, unfiltered,

Fig. 4 (case 4).—Pustular exacerbation of acne vulgaris following oral sulfathiazole medication. The acneform flare-up appeared only at the sites at which a sulfathiazole lotion had been applied previously.

85 kilovolt peak, 5 milliamperes, anode-skin distance 12 inches) at intervals of seven to fourteen days. By September 30 he had received a total of 750 roentgens and the eruption had disappeared almost entirely. Local medication had consisted only of a lotion containing sulfathiazole 3 per cent, and sulfur 3 per cent which he applied to his face, but not to the remainder of the eruption, by means of a moistened piece of cotton held in either hand.

Six weeks after the use of the lotion was begun a dermatitis appeared on the face and hands. He stopped using the lotion, and the eruption disappeared within one week. Several days later he again applied the preparation, and a prompt recurrence of the dermatitis followed. Following subsidence of this condition the same lotion was prescribed but with the omission of the sulfathiazole. He was able to use this preparation without ill effect.

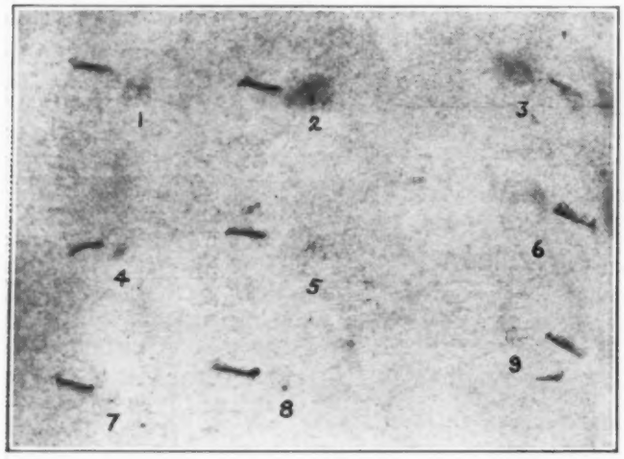

Fig. 5 (case 2).—Passive transfer tests of Prausnitz-Küstner type. Immediate wheal reactions to sulfathiazole on sites injected with both blood and blister serums. Controls are negative or show only minimal reactions: 1. Sulfathiazole 0.1 per cent solution alone. 2. Sulfathiazole 0.1 per cent solution injected at a site sensitized with patient's blood serum. 3. Sulfathiazole 0.1 per cent solution injected at a site sensitized with patient's blister serum. 4. Sulfathiazole 0.02 per cent solution alone. 5. Sulfathiazole 0.02 per cent solution injected at a site sensitized with patient's blood serum. 6. Sulfathiazole 0.02 per cent solution injected at a site sensitized with patient's blister serum. 7. Ambotoxoid (1: 10) alone. 8. Ambotoxoid (1: 10) injected at a site previously sensitized with patient's blood serum. 9. Ambotoxoid (1: 10) injected at a site previously sensitized with patient's blister serum.

On October 7 the patient's home physician prescribed sulfathiazole tablets for oral administration because the patient complained of a sore throat. Within twenty-four hours, after he had taken 4 tablets, acute redness and swelling of the face developed. This was accompanied by a prompt and pronounced pustular exacerbation of the acne on the face only. The other sites of the preexisting acne were not affected. The temperature rose to 101 F. but dropped to normal the next day after the drug had been discontinued. Five days later the dermatitis was about 50 per cent better and the acneform flare-up had begun to subside (fig. 4).

ALLERGIC STUDIES

Allergic studies were performed on patients 1, 2 and 3. The results of these are shown in the accompanying table. All experiments were in the nature of passive transfer tests. Blood serums and blister serums were obtained from the patients. At a number of sites 0.1 cc. of each of these fluids was injected intracutaneously on a control subject not sensitive to sulfathiazole. The next day these sites were injected intracutaneously with 0.1 cc. of the test solutions (sulfathiazole or control preparations) (Prausnitz-Küstner

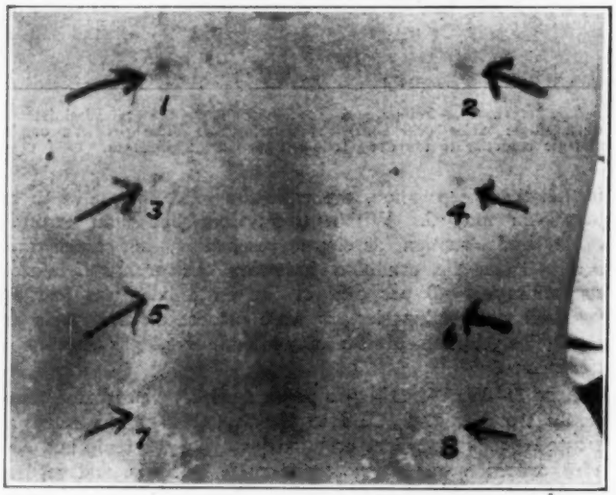

Fig. 6 (case 1).—Passive transfer tests of the Prausnitz-Küstner type. Delayed tuberculin type reactions to sulfathiazole with both blood and blister serums: 1. Sulfathiazole 0.1 per cent solution injected at a site sensitized with patient's blood serum. 2. Sulfathiazole 0.1 per cent solution injected at a site sensitized with patient's blister serum. 3. Isotonic solution of sodium chloride injected at a site sensitized with patient's blood serum. 4. Isotonic solution of sodium chloride injected at a site sensitized with patient's blister serum. 5. Isotonic solution of sodium chloride alone. 6. Sulfathiazole 0.1 per cent solution alone. 7. Patch test with 5 per cent sulfathiazole ointment. 8. Patch test with 20 per cent sulfathiazole ointment.

technic) or patch tests were applied with sulfathiazole ointment and appropriate controls (Urbach-Koenigstein technic [13]).

The blister fluid was obtained by applying on the patient's skin a cantharides plaster 1.5 by 1.5 cm. to a normal skin site. The application was inspected every two hours. When a blister had formed, the plaster was removed and the fluid was aspirated with a tuberculin syringe.

The Prausnitz-Küstner Tests.—In the 3 cases tested passive transfer of sensitivity to sulfathiazole was demonstrated with both blood and blister serums. In addition to the usual positive wheal reactions appearing within thirty minutes of the injection of the suspected antigen, there occurred also delayed tuberculin type reactions at the sulfathiazole injected sites which were observed at forty-eight hours. Control injections

13. Urbach, Erich: Allergy: Principles and Therapy, New York, Grune & Stratton, Inc., 1943.

consisting of serums alone and sulfathiazole solution alone were used. In case 1 isotonic solution of sodium chloride and in case 2 staphylococcus ambotoxoid (Squibb) in a dilution of 1:10 were used alone and were also injected at sites previously prepared by the injection of sensitized blood and blister serums. As a further control in case 2 blood and blister serums from a nonsensitive person and in case 3 blood serum also from a normal subject were injected synchronously and in a parallel fashion with the sensitized serums.

With a single exception all control sites gave negative or minimal 1 plus reactions. At the sites at which the normal blister fluid was injected (case 2) 2 plus reactions were present at the thirty minute readings, but the forty-eight hour reaction was read as 1 plus. The former reading was possibly due to a small amount of cantharides which contaminated the fluid.

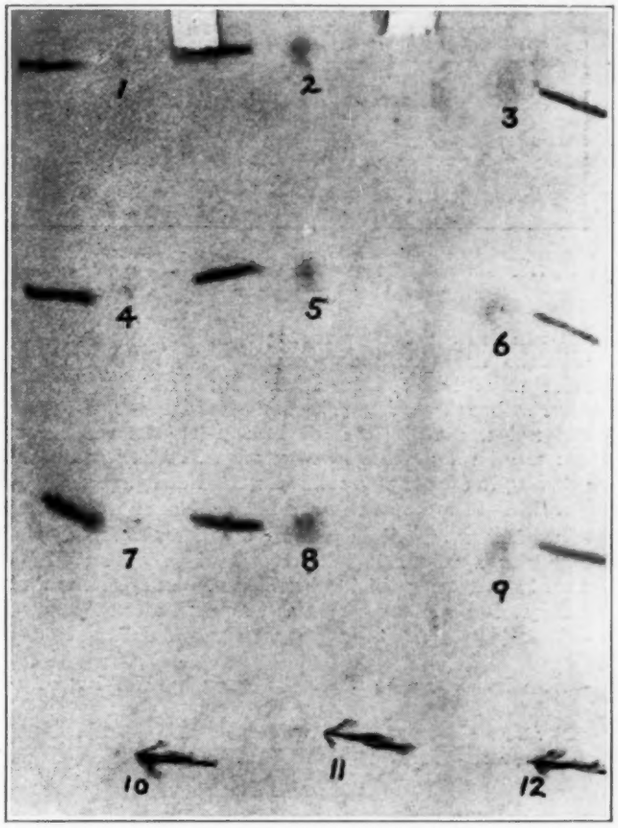

Fig. 7 (cases 2 and 3).—Passive transfer tests of the Prausnitz-Küstner type. Delayed tuberculin type reactions to sulfathiazole with blood serum: 1. Sulfathiazole 0.1 per cent at a site injected with control blood serum. 2. Sulfathiazole 0.1 per cent at a site injected with blood serum of patient 2. 3. Sulfathiazole 0.1 per cent at a site injected with blood serum of patient 3. 4. Sulfathiazole 0.02 per cent at a site injected with control blood serum. 5. Sulfathiazole 0.02 per cent at a site injected with blood serum of patient 2. 6. Sulfathiazole 0.02 per cent at a site injected with blood serum of patient 3. 7. Sulfathiazole 0.01 per cent at a site injected with control blood serum. 8. Sulfathiazole 0.01 per cent at a site injected with blood serum of patient 2. 9. Sulfathiazole 0.01 per cent at a site injected with blood serum of patient 3. 10. Sulfathiazole 0.02 per cent alone. 11. Blood serum of patient 2 alone. 12. Blood serum of patient 3 alone.

All sensitized sites in which sulfathiazole solution was injected showed definitely positive reactions (3 plus or 4 plus), indicating of course the presence of circulating antibodies to sulfathiazole in both blood and blister serums.

Photographs are reproduced to illustrate some of these reactions. Figure 5 shows early wheal reactions to blood and blister serums in case 2. Figure 6 pictures the delayed type reactions in case 1, while similar reactions in case 3 are shown in figure 8. Figure 7 is

Fig. 8. (case 3).—Passive transfer tests of the Prausnitz-Küstner type. Delayed tuberculin type reactions to sulfathiazole with both blood and blister serums. 1. Patient's blood serum alone. 2. Patient's blister serum alone. 3. Sulfathiazole 0.1 per cent solution on skin sensitized with patient's blood serum. 4. Sulfathiazole 0.1 per cent solution on skin sensitized with patient's blister serum. 5. Sulfathiazole 0.02 per cent solution on skin sensitized with patient's blood serum. 6. Sulfathiazole 0.02 per cent solution on skin sensitized with patient's blister serum. 7. Sulfathiazole 0.1 per cent solution alone. 8. Sulfathiazole 0.02 per cent solution alone. 9. Sulfathiazole 0.02 per cent solution plus control (normal) blood serum.

Fig. 9 (case 2).—Passive transfer tests of the Urbach-Koenigstein type. Erythematous reaction to sulfathiazole patch test on blister fluid injected site: Sulfathiazole ointment 20 per cent on site injected with (1) patient's blood serum, (2) patient's blister serum. 3. Ointment base on the site injected with patient's blood serum. 4. Ointment base on site injected with patient's blister serum. 5. Sulfathiazole ointment 20 per cent alone. 6. Ointment base alone. 7. Isotonic solution of sodium chloride on site injected with patient's blood serum. 8. Isotonic solution of sodium chloride on site injected with patient's blister serum. 9. Patient's blood serum alone. 10. Patient's blister serum alone.

of interest because delayed type reactions in both cases 2 and 3 are seen on the same test subject.

The Urbach-Koenigstein Passive Transfer Test.—The reactions to this test were not striking but highly suggestive. Reactions occurred only at the sites sensitized by the blister fluid when sulfathiazole in an ointment base was applied for forty-eight hours as a patch test. Cases 1 and 2 showed 1 plus reactions, as indicated by definite erythema and subsequent scaling at the site of the test. In case 3 the reaction was negative. In all 3 cases all control test sites with ointment base

contact type dermatitis.[14] A peculiar feature of the eruption in the experience of Pillsbury[15] and ourselves is that the dermatitis, instead of presenting the usual appearance of dermatitis venenata, tends to manifest itself as an exacerbation of the eruption for which the patient is being treated. In cases 1 and 3 the sulfathiazole seemed to produce a flare-up of the original process locally with an "id"-like generalization. The eruption in case 2 was basically a vesicular and pustular dermatitis. With sulfathiazole sensitization the activity of the process increased, and subsequently bullous lesions

Passive Transfer Tests

	Tests Made on First Day																			
	Intracutaneous Injections																Patch Tests			
	Patient's Blood Serum		Patient's Blister Serum		Control Blood Serum		Control Blister Serum		Sulfathiazole 0.1 %		Sulfathiazole 0.02 %		Isotonic Solution of Sodium Chloride		Ambo-toxoid Dilution 1:10		Isotonic Sol. of Sodium Chloride	Sulfathiazole 5%	Sulfathiazole 20%
Tests Made on Second Day																			
Case 1																			
Control	1+	0	1+	0	...	...	...	...	1+	1+	...	...	1+	1+	...	...	..	0	0
Patch test																			
Isotonic solution of sodium chloride	...	0	...	0	...	...	...	...	...	...	...	...	..	...	...	...	..	..	..
Emulsion base	...	0	...	0	...	...	...	...	...	...	...	...	...	...	...	...	..	..	..
Sulfathiazole 20% in emulsion base	...	0	...	1+	...	...	...	...	...	...	...	...	...	...	...	...	..	..	..
Injection																			
Sulfathiazole solution 0.1%	3+	3+	4+	4+	...	...	...	...	...	...	...	...	...	...	...	...	..	..	..
Isotonic solution of sodium chloride	1+	0	1+	0	...	...	...	...	...	...	...	...	...	...	...	...	..	..	..
Case 2																			
Control	1+	0	1+	0	1+	0	2+	1+	1+	1+	1+	0	1+	0	1+	0	0	0	0
Patch test																			
Isotonic solution of sodium chloride	...	0	...	0	...	...	...	...	...	...	...	...	...	...	...	...	..	..	..
Emulsion base	...	0	...	0	...	...	...	...	...	...	...	...	...	...	...	...	..	..	..
Sulfathiazole 20% in emulsion base	...	0	...	1+	...	...	...	...	...	...	...	...	...	...	...	...	..	..	..
Injection																			
Sulfathiazole solution 0.1%	3+	4+	3+	4+	1+	1+	2+	1+	...	...	...	...	...	...	...	...	..	..	..
Sulfathiazole solution 0.02%	3+	4+	3+	4+	1+	0	2+	0	...	...	...	...	...	...	...	...	..	..	..
Ambotoxoid dilution 1:10	1+	0	1+	0	1+	0	2+	0	...	..	...	...	...	...	...	...	..	..	..
Case 3																			
Control	1+	0	1+	0	1+	0	...	...	1+	1+	1+	0	...	...	...	...	..	..	..
Patch test																			
Emulsion base	...	0	...	0	...	...	...	...	...	...	...	...	...	...	...	...	..	..	..
Sulfathiazole 20% in emulsion base	...	0	...	0	...	...	...	...	...	...	...	...	...	...	...	...	..	..	..
Injection																			
Sulfathiazole solution 0.1%	3+	3+	3+	3+	1+	1+	...	...	...	...	...	...	...	...	...	...	..	..	..
Sulfathiazole solution 0.02%	3+	3+	3+	3+	1+	0	...	...	...	...	...	...	...	...	...	...	..	..	..

Reactions estimated as 1+, 2+, 3+ and 4+.
Figures on the left side of each column represent immediate reactions, while those on the right side represent delayed reactions.

and isotonic solution of sodium chloride were completely negative. Figure 9 shows the results of these experiments in case 2.

A simple direct patch test was performed in case 3 which gave a negative reading. It was thought unwise to perform direct patch tests in the other 2 cases because of the fulminating nature of the eruptions. Direct intracutaneous testing was not done for the same reason.

COMMENT

A number of features about these eruptions are worthy of emphasis. It is obvious that sulfathiazole used as a local cutaneous application can cause a local dermatitis with or without a generalized disseminate eruption. In the literature summarized here and also in case 3 reported here direct patch tests were negative in spite of the fact that the eruption appears to be a

appeared. Eventually with increasing sensitization the process became pemphigoid.

Another feature of this group of cases is the fact that local application of sulfathiazole gives rise to generalized sensitization in the sense that subsequent oral administration of the drug may precipitate a sulfathiazole dermatitis. Again this eruption tends to mimic the condition for which the patient was originally treated, and also it begins and is more pronounced at the sites at which sulfathiazole was applied locally.

Case 4 illustrates the pustular exacerbation precipitated by sulfathiazole following the "cure" of a case of pustular acne vulgaris. Although the patient suffered from acne of the face, chest and back, he applied the

14. As noted previously, Weiner's[5] report is an exception to this statement.
15. Pillsbury, D. M.: Personal communication to the authors.

lotion to the face only with his fingers. The contact type dermatitis appeared on the face and hands, while the acneform flare-up was localized to the face.

It is possible that the primary dermatitis sets the reaction type or pattern for the sulfathiazole eruption or that sulfathiazole sensitization manifests itself as a Herxheimer-like exacerbation of the original eruption. Manifestations of this type have been noted by a number of authors in the treatment of lupus erythematosus with various sulfonamide compounds.[16]

It is to be noted that at the time of primary sensitization with sulfathiazole by local cutaneous application of the type discussed local manifestations of this sensitivity may or may not be present.

It is our impression that pyogenic sensitivity, especially to the staphylococcus, such as is frequently seen in certain examples of the syndromes described as acrodermatitis perstans, staphylodermia, acute seborrheic dermatitis, infectious eczematoid dermatitis, infantile eczema and nummular eczema, plays a major role as an underlying factor in inducing sensitizations of this type. In cases 1, 2 and 3 there was pronounced sensitization to staphylococcus ambotoxoid. It is possible that the reaction produced by the injections of the ambotoxoid acted synergetically with the sulfathiazole in enhancing its sensitizing potentialities. On the other hand, the Herxheimer-like effect of the sulfathiazole discussed may be mediated by way of the liberation of bacterial toxins to which the patient is sensitive, thus causing an effect similar to the injection of staphylococcus ambotoxoid itself. Livingood and Pillsbury [3] also mention the importance of pyogenic activity in their group of cases. Milian,[17] in his concept of "biotropism," has emphasized the role that drugs may play in activating latent infectious processes.

In spite of the fact that all reported allergic studies in cases of sulfathiazole eruptions of the "toxic" type have been generally negative, in cases 1, 2 and 3 of this group the passive transfer tests performed with the Prausnitz-Küstner technic were all positive. Not only did the positive tests include the usual early or wheal-like reactions, but also delayed or tuberculin type reactions were noted. This is not part of the usual Prausnitz-Küstner phenomenon and we are unable to explain its significance at present.

In cases 1 and 2 passive transfer of antibodies with the Urbach-Koenigstein technic was probably demonstrated. According to Urbach, this indicates the presence of antibodies in the epidermis and the absence of similar antibodies in the blood stream.

CONCLUSIONS

1. Sulfathiazole as a local cutaneous application is capable of causing cutaneous sensitization.

2. This sensitization may manifest itself as a local contact type dermatitis with or without a disseminate eruption, or it may appear as a local or generalized exacerbation of the dermatitis for which that patient is being treated.

3. Sulfathiazole sensitization induced by local cutaneous application may at times be elicited by oral administration of the drug. The original local sensitizing exposure to the sulfathiazole may or may not have resulted in local dermatitis. The eruption precipitated by the ingestion of sulfathiazole tends to begin and to be most severe at the sites where the sulfathiazole is applied locally, although it may later disseminate widely. Here again it may mimic the eruption for which the patient is being treated.

4. Simple direct patch tests appear to be negative in the disseminate eruptions, but passive transfer tests performed with the Prausnitz-Küstner technic are positive to sulfathiazole and give positive delayed tuberculin type reactions, as well as the usual early wheal reactions. It seems probable that the Urbach-Koenigstein type of passive transfer test may also be positive in some of these cases.

5. It seems likely that pronounced pyogenic sensitivity, especially to the Staphylococcus, is important as a predisposing factor in many of these eruptions.

16. Barber, H. W.: Effects of Sulfonamide Compounds on Lupus Erythematosus, Brit. J. Dermat. **53**: 1-18 (Jan.), 33-45 (Feb.) 1941. Propert, S. A.: Lupus Erythematosus: Toxic Effects of Sulfonamides, Lancet **2**: 5-6 (July 6) 1940. Brunsting, S. A.: Pennsylvania M. J. **45**: 1261-1266 (Sept.) 1942.

17. Milian, G.: Roséole infectieuse biotropique au cours du traitement arsénical, Rev. franç. de dermat. et de venéréol. **6**: 149-151 (March) 1930.

DHOBIE MARK DERMATITIS

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FIRST LIEUTENANT ARTHUR M. ROGERS
AND
LIEUTENANT COLONEL THOMAS FITZ-HUGH JR.
MEDICAL CORPS, ARMY OF THE UNITED STATES

When the personnel of the 20th General Hospital was first exposed to dhobie laundered clothes, soon after arrival in the C. B. I. theater, a small epidemic of patchy dermatitis made its appearance, which in all instances was distressing and in a few was temporarily incapacitating. The exact localization of the circumscribed patches of dermatitis on that part of the skin in contact with the dhobie mark and the course of the lesions made it quite obvious that this represented a contact dermatitis induced by the marking fluid which the native dhobies or washermen used in making their characteristic laundry marks (fig. 1).

Having now completed identification of the causative agent, we make this report with a view of recording "dhobie mark dermatitis" as an entity which, to the best of our knowledge, has not been reported previously. We believe that our observations suggest a possible derivation of the term "dhobie itch" and that this term used in the classic sense as a synonym for cutaneous mycoses (particularly tinea cruris) in the tropics is misleading and erroneous and should be discarded for reasons which will be discussed.

CLINICAL DATA AND INCIDENCE

Of 55 officers exposed there were 11 cases (20 per cent incidence); of 344 men exposed there were 41 cases (11.9 per cent incidence). The manifestations were similar in all cases and the only variation was in the severity of involvement. Susceptible individuals invariably noted localized pruritus at the site of contact with the mark, sometimes within a few hours after the first exposure but more frequently after one or two exposures extending over a total period of time varying from eight to twenty-four hours. This was followed by localized lesions varying in severity from moderate erythema and edema to definite vesiculation, oozing and crusting (figs. 2 and 3). One or more of the following sites were always involved: nape of the neck and upper back, waist line (anterior, posterior or on one side),

Illustrations by First Detachment, Museum and Medical Arts Service, First Lieut. C. Graham Eddy, Sn. C., in charge.

From the Section of Dermatology and Syphilology (Major Livingood), Receiving and Evacuation Section (Lieutenant Rogers) and Medical Service (Lieutenant Colonel Fitz-Hugh) of the 20th General Hospital, A. P. O. 689.

sides of the ankles, dorsal surface and sides of feet and lower one third of the legs. In every case the sites of the lesions correspond exactly with one or more of the dhobie marks on the recently laundered clothes worn by the individual (fig. 4). In more sensitive persons the dermatitis extended beyond these sites and in a few very sensitive ones a generalized "id" eruption occurred. The pruritus was intense in all cases and in some instances almost intolerable; it increased in severity as exposure to the mark was prolonged and in some cases recurred within thirty minutes after the marked clothes were worn. The itching disappeared and the lesions began to heal as soon as dhobie marked clothing was discarded. A few severe cases, however, required as long as two weeks for complete recovery. Recurrence of lesions was noted promptly if "marked" clothes were again worn.

THE DHOBIE MARK

The marking fluid used by dhobies throughout India is obtained from the nut (fig. 5) of the ral or bella gutti [1] tree, which is said to be common in this country. A straight pin is pushed through the hard capsule of the nut and enough dark brown or black fluid adheres to the pin to make possible the marking of clothes with

Fig. 1.—Dhobie laundry marks on collar of shirts (: I), waist band of shorts (!) and ankle of socks (V).

small crosses, dots or lines in various combinations sufficient to identify the clothing (fig. 1). The marks are fairly permanent and withstand repeated washings. Khaki shirts and cotton undershirts are usually marked inside the back of the collar, cotton shorts and khaki trousers inside the waist band and socks near the top or sides and occasionally above the heel (fig. 1). There is a common superstition among the natives of this country that the ral or bella gutti tree has strong "likes" and "dislikes" for certain individuals, expressing its dislikes by "poisoning" its enemies when they approach the tree. On close questioning of several intelligent natives, we have learned that the poisoning referred to is manifested by itching, edema, erythema and vesiculation on exposed parts. It would seem that the foliage of this tree causes an acute contact dermatitis when sensitive persons are exposed.

PATCH TESTS

It is obvious that a patch test is applied to a person every time he wears a piece of dhobie marked clothing, variations occurring because of the site involved. For example the contact with the skin at the collar line is more intimate if the person wears a necktie; it makes a great difference in incidence of involvement at the waist line if the cotton undershirt separates the mark from

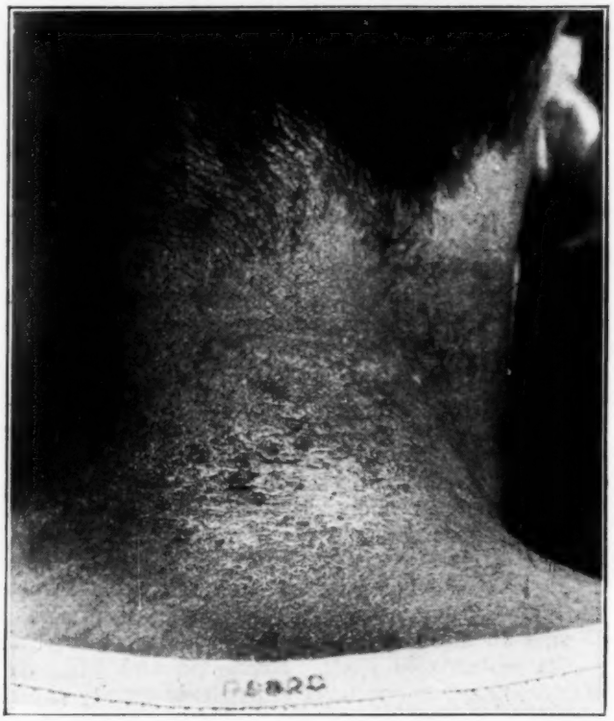

Fig. 2.—Typical patch of dhobie mark dermatitis due to dhobie mark on collar of khaki shirt.

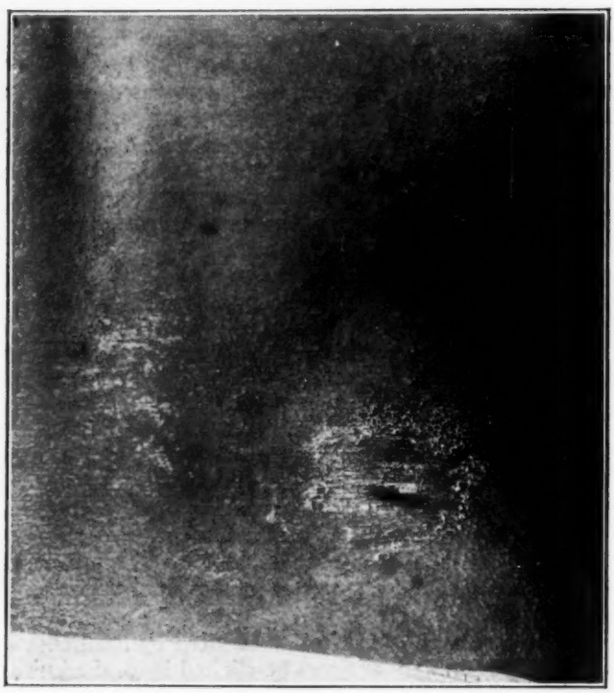

Fig. 3.—Subsiding patch of dhobie mark dermatitis on right lower back at waist line due to dhobie mark on shorts.

actual contact with the skin; there is more maceration and closer contact with the skin when high shoes cover the mark on socks. A large series of patch tests was done not only to prove the causation but also to establish constant factors so that the true incidence of sensi-

1. Situated as we are with no suitable library facilities, we are unable to verify the accuracy of the designation of this tree furnished us by a line officer of the Indian army, who was interested in our researches.

tivity could be determined. They were prepared by marking small strips of white cotton cloth with the fluid of the ral nut in exactly the same manner as the dhobie marks are applied to clothing. Such patches were fixed to the flexor surface of the forearm with the conventional cellophane covering and adhesive. They were removed after forty-eight hours and readings made then and again at the end of one week.

The 41 soldiers who had exhibited this form of dermatitis and 52 control subjects (soldiers exposed to prior contact with dhobie marked clothes who had not developed dermatitis) were thus tested, and the results are recorded in the table.

Following this preliminary series of patch tests an additional 332 patch tests with various modifications were carried out on voluntary subjects [2] both "sensitives" and "controls." The results of these tests may be summarized as follows:

1. The juice from older (dried) nuts causes a lower percentage of positive patch tests and uniformly the reaction is less pronounced than that from green nuts.

2. Boiling the marked patches for from five to thirty minutes does not destroy the sensitizing effect. Indeed, in some sensitive persons the boiled patches produce more violent reactions than the unboiled.

Results of Patch Tests

	Results						
	Negative	Plus 1	Plus 2	Plus 3	Plus 4	Total Positives	Total
Previously affected persons	8*	14	15	3	1	33 (80.5%)	41
Previously exposed non affected controls	45	7	0	0	0	7† (13.4%)	52

* Later found positive to fluid from green nuts possessing greater sensitizing properties.

† It is noteworthy that even though 7 controls exhibited reactions these were all minimal.

3. A lapse of twenty days between preparation of the patches and testing does not alter the reaction producing qualities.

4. Exposure of marked patches to sunlight for four hours does not alter the reactivity of the substance.

5. The following solvents applied to prepared patches for five minutes fails to decrease the sensitizing property of the marking fluid significantly: white gasoline, 95 per cent alcohol, ether and acetone.

6. One washing of the marked patches in soap and water fails to affect the reaction.

COMMENT

It has been accepted as a fact that dhobie laundered clothes are responsible for the transmission of fungous infections, particularly tinea cruris. Physicians and laymen alike use the term "dhobie itch" and "tinea cruris" interchangeably, and some extend the use of the term to include epidermophytosis and tinea of the glabrous skin.

The Suttons [3] in their authoritative book define the term "dhobie itch" as follows: "Dhobie itch (washerman's itch) is tropical epidermophytosis, the eczema marginatum of other climates. Owing to warmth and perspiration the symptoms are greatly exaggerated, and violent scratching and secondary pyogenic infection soon render the parts raw and inflamed, often with resultant impetigo, infectious eczematoid dermatitis and even furunculosis."

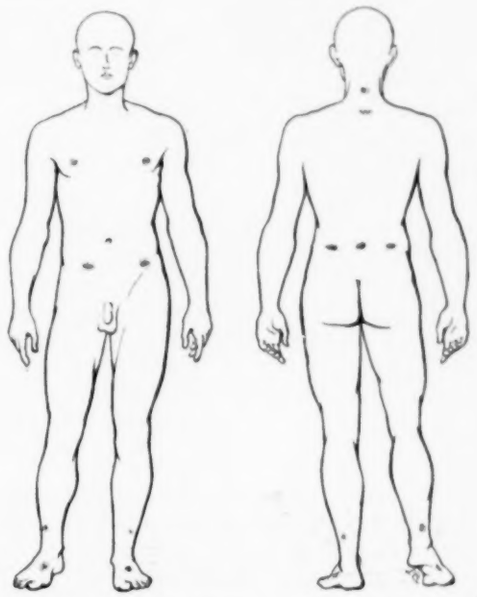

Fig. 4.—The stippled areas indicate the usual primary site of involvement in "dhobie mark dermatitis."

Strong [4] similarly states: "Tinea cruris: Under the name "dhobie itch" this fungous affection is probably better known to Europeans than any tropical skin disease. The name "dhobie" or "washerman's itch" has been given on account of associating it with the infection of the underclothing while being washed with the garments of those who have the affection. This view probably has some foundation but it has been difficult to verify it."

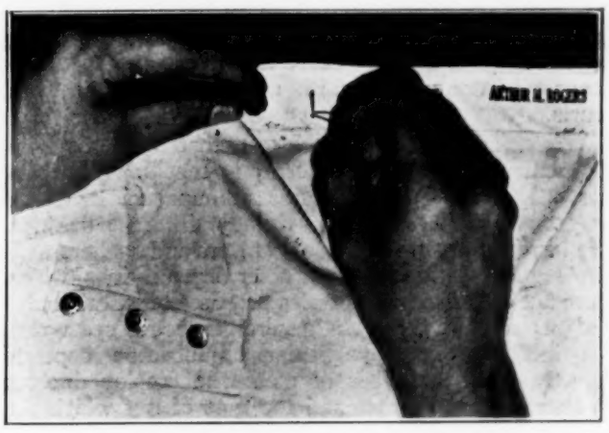

Fig. 5.—Method used by dhobies in marking clothes. The nut held between left thumb and index finger is about 20 mm. long, 15 mm. wide and 5 to 12 mm. thick.

We believe that it is erroneous and misleading to use the term "dhobie itch" as a synonym for cutaneous fungous infections of any type for the reasons given in the following three paragraphs.

2. These men, especially Staff Sergeant Robert DeSilver and Staff Sergeant George Heston, gave patient cooperation.

3. Sutton, R. L., and Sutton, R. L. Jr.: Diseases of the Skin, ed. 10, St. Louis, C. V. Mosby Company, 1939, p. 1045.

4. Strong, Richard P.: Stitt's Diagnosis, Prevention and Treatment of Tropical Diseases, ed. 6, Philadelphia, Blakiston Company, 1942, vol. 2, p. 1168.

1. As far as we know, there is no evidence to the effect that cutaneous fungous infections are transmitted by dhobie laundered clothes. We have followed for three months a large group of men who have worn dhobie washed clothes and have been able to compare the incidence of cutaneous fungous infections in them with that previously observed in the same group under quite similar climatic conditions before exposure to dhobie washed clothes. We are able to state that as far as this group is concerned there has been no increase in incidence of fungous infections. Furthermore, there are no isolated examples in which the origin of a cutaneous fungous infection of any type could be traced to dhobie laundered clothes.

2. There is no reason to believe that the causative agent of cutaneous mycoses of any type is superimposed in the clothes during the laundering procedure. Usually the clothes are washed in streams either by beating them against rocks or by repeated rinsing and scrubbing.[5] The more "conscientious" dhobies boil the clothes and use a high alkali native soap to remove most of the dirt. For the most part individual pieces are exposed to the sun on clothes lines or spread over the ground and on bushes of convenient height.[6] It would seem that this process should remove most pathogenic fungi and, if tinea cruris is transmitted by dhobie washed clothing, it is contrary to what is known about the epidemiology of the disease.

3. The fact that we have discovered one source of cutaneous disease as the result of wearing dhobie laundered clothes, the possibility of impregnating clothes with allergenic weeds, grasses and leaves by contact during the drying process and similar impregnation with high alkali soap make it very probable that the only cutaneous disease which results from wearing dhobie laundered clothes is contact dermatitis.

We believe that the course of events in the origin and subsequent misuse of the term dhobie itch is as follows: It was recognized that some individuals acquire skin diseases after wearing dhobie laundered clothes; tinea cruris is very common in tropical climates; dhobies wash clothes in many tropical countries; hence the association of cause and effect and the erroneous adoption of the term as a synonym for tinea cruris.

We learned from our patch tests that the fluids from different nuts vary tremendously in sensitizing properties. This of course explains the unequal incidence in groups of persons who employ different dhobies. We have seen many individual officers and soldiers with dhobie mark dermatitis from other organizations, which were not included in our series because statistical analysis was not possible. In general it would seem that the incidence in a particular organization depends directly on the number of men who employ dhobies to launder their clothes and the type of nut which the dhobie happens to use.

We did not make patch tests on Negro soldiers. Our experience with them in this area indicates that they are much less sensitive to the dhobie mark than white persons.

Although one soap and water washing of the patch test fails to affect the reaction, we have clinical evidence which indicates that repeated washings minimize and eventually may even eradicate the dhobie marks to such an extent that most susceptible persons may wear the marked clothes without incurring dermatitis. Some persons, however, have had recurrence of dermatitis from marked clothes which had been washed as many as seven times. The sensitization is obviously a relative one; it depends on personal sensitivity, on the qualities of the nut employed and perhaps on other factors as yet undetermined.

Investigations are being continued in an effort to determine a practical method of removing the dhobie mark from clothing. At the present time we advise, for sensitive persons:

1. Repeated washings of marked clothes.
2. Removal of marked parts of clothing by cutting with scissors.
3. Furnishing commercial indelible ink to dhobies.
4. Covering the marks with adhesive tape or similar material.
5. Personal dhobies or self service without marking. Although unsatisfactory, this is the safest procedure for highly susceptible persons.

SUMMARY AND CONCLUSIONS

1. Fifty-two cases of localized contact dermatitis occurred in one organization (20th General Hospital) following the wearing of clothes marked by native dhobies. This represented an incidence of 14 per cent of exposed persons. It varied in severity from slight erythema and itching to an acute vesicular and bullous patch of dermatitis with extension to other parts and "id" manifestations which were incapacitating.

2. The brown or black liquid contents or "juice" obtained from the nut of the ral or bella gutti tree, used by the dhobies in marking clothes, has been identified as the causative agent.

3. Of previously affected persons, 80.5 per cent were positive to patch tests (1 to 4 plus) which duplicated under standard controlled conditions the exposure to marking fluid. The remaining 19.5 per cent were positive only when tested with marking fluid obtained from green nuts. Only 13.4 per cent of previously exposed but unaffected persons were positive to patch test (1 plus) and in this group all of the reactions were minimal. Marking fluid obtained from green nuts caused a higher percentage of positive patch tests and more pronounced reaction than fluid obtained from older (dried) nuts.

4. We are of the opinion that the dhobie mark is the probable cause of most cutaneous disease acquired from wearing dhobie laundered clothes.

5. We believe it most unlikely that cutaneous fungous infections are transmitted by clothing washed by dhobies and therefore urge that the use of the term "dhobie itch" as a synonym for tinea cruris and epidermophytosis be discontinued. The term represents an erroneous concept and leads to error in diagnosis and treatment of certain cutaneous diseases seen in the "land of the dhobie." We have not seen an increase of cutaneous mycoses in a large group of men who have worn dhobie laundered clothes continuously during a three months observation period.

6. The importance of "dhobie mark dermatitis" as a cause of disability in American officers and men in this theater is obvious.

7. We have designated this cutaneous disease "dhobie mark dermatitis."

5. Buttons are broken with disturbing regularity.
6. During the monsoon or rainy season it is customary to dry the clothes indoors, and exposure to sunlight is minimal.

DERMATITIS FROM SEMECARPUS ANACARDIUM (BHILAWANOL OR THE MARKING NUT)

SPREAD BY CONTAMINATED MAIL

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These cases are reported because of the novelty of the mode of spread of a contact dermatitis and to report a plant irritant uncommon to the Western Hemisphere.

Dermatitis affecting 16 persons developed among employees of one of the large government departments in Washington, and the Dermatoses Investigations Section was requested to investigate.

A bottle in a sealed mailpouch, shipped from India by air, had become partially opened and its contents, a thick black oil, had contaminated various pieces of mail. The contaminating substance was labeled "Bhilawanol Oil."

REPORT OF CASES

Three workers who were unpacking the pouch wiped the oil off the mail as well as they could. It was then distributed by a force of carriers and clerks numbering approximately 50. By evening a number of workers complained of itching and burning of their hands, arms and faces. Within twenty-four hours a vesicular eruption appeared on the exposed parts. Some of the workers did not touch the mail until as long as five days after it was unpacked, but these also developed an eruption twenty-four to forty-eight hours after contact. Eventually 16 of approximately 50 exposed persons developed dermatitis of varying degrees of severity.

The eruption consisted of erythematous patches surmounted by vesicles of various sizes, many lesions being linear. The appearance was similar to that of typical dermatitis venenata from Rhus toxicodendron. Most of those affected had lesions on the flexor surfaces of their forearms, as in the illustration.

On 14 of those affected, lesions healed quickly under wet dressings of boric acid or Burow's 1 : 20 solution. These patients were apparently completely well by the end of ten days. The other 2 did not recover for three weeks. Neither followed this treatment. One said that she had used Clorox and Fels-Naptha soap, which are not as bland as the solutions mentioned, while the other applied a proprietary ointment. There have been no sequelae in six months.

PATCH TESTS

A ¼ inch square of the contaminated paper, placed on a previously unexposed volunteer's forearm, resulted in severe burning in six hours and the development of a small bulla six hours later.

Patch tests, using ¼ inch squares of cloth impregnated with the oil diluted 1 : 100 and 1 : 1,000 by weight in olive oil, were applied for twenty-four hours to the forearm of one of the affected men, four weeks after recovery. Strongly positive reactions resulted in forty-eight and seventy-two hours respectively to the two dilutions.

Bhilawanol oil is obtained from the juice of the marking nut tree (Semecarpus anacardium), which grows in the tropical outer Himalayas and the hotter parts of India. It is a member of the same family Anacardiaciae as the several irritant rhus plants of North America, the cashew nut and the agent causing dermatitis in Japanese lacquer. The tree is 20 to 40 feet high, 4 to 6 feet thick and deciduous It bears an ovoid, plumlike fruit about 1 by ¾ inches. The flesh is orange-red, succulent, sweet and edible when ripe. The pericarp is smooth and shining black and contains a dark brown or black, corrosive resinous juice which is used for dyeing linen and other materials black; hence the name "marking nut." For centuries the juice has also been credited with medicinal qualities. It has been used by the natives and native physicians for the treatment of palsy, epilepsy, nervous conditions and varied skin disorders. The oil has been given internally by European educated physicians with claimed benefits for asthma, rheumatism and various organic neuropathies.[1]

Typical lesions on the forearm of a girl clerk following exposure to mail contaminated by bhilawanol oil.

All agree that the tar or oil is highly irritant to the skin, possessing a distinct vesicant action. Three substances have been found in the black juice of the pericarp: "semecarpol," a monohydroxyphenol; "bhilawanol," a dihydroxy compound, $C_{21}H_{32}O_2$, and a tarry corrosive residue from which no further chemical individual could be isolated. Neither anacardic acid, cardol, catechol nor anacardol is present.[2]

From the Dermatoses Investigations Section, Division of Industrial Hygiene, National Institute of Health, U. S. Public Health Service.

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METABOLIC STUDIES OF PATIENTS WITH CANCER OF THE GASTRO-INTESTINAL TRACT

XVI. THE TREATMENT OF HYPOCHLOREMIA REFRACTORY TO THE ADMINISTRATION OF SODIUM CHLORIDE, ESPECIALLY IN PATIENTS WITH GASTROINTESTINAL CANCER

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GEORGE T. PACK, M.D.
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Immediate postoperative disturbances of water and electrolyte balance usually are corrected promptly by the adequate administration of isotonic solution of sodium chloride. Some instances of postoperative hypochloremia, however, are refractory to that procedure. This was noted first by Maddock as particularly common among patients with cancer of the gastrointestinal tract. He [1] observed, furthermore, that when patients with this disorder began to eat an adequate diet the hypochloremia abated, but no explanation for this response was advanced. The existence of this type of hypochloremia now has been observed also in this hospital and appears to mark the postoperative course especially of patients with gastrointestinal disease.

Attention first is directed to these patients usually because of their lethargy, anorexia, nausea and increasing abdominal distention. Blood studies reveal hypochloremia, alkalosis and hypoproteinemia. The intestine gradually becomes inactive. Flat roentgenograms of the abdomen are consistent with the picture of intestinal obstruction, and at laparotomy edema of the intestine is found. The symptoms of fluid retention appear to be localized to the gastrointestinal tract and lungs, and only after the administration of considerable saline solution (in an attempt to counteract the hypochloremia) does peripheral edema appear.

Since the fluid and electrolyte balance of the organism is connected intimately with the concentrations of protein in the serum,[2] it was conceived that the hypoproteinemia rendered ineffectual attempts to treat the hypochloremia by isotonic saline solution. If this should be the case, treatment of the altered electrolyte equilibrium should include measures to raise protein levels. Accordingly, patients who manifested the syndrome described were given orally or parenterally large amounts of protein. The results of these measures form the subject of the present communication.

METHODS

1. Serum proteins were determined by the technic of Weech and his associates [3] as well as by the Kjeldahl procedure.[4] The normal range of serum proteins found here [5] and elsewhere [6] is from 6.6 to 7.5 Gm. per hundred cubic centimeters.

2. Serum chlorides were measured by the method of Wilson and Ball.[7] Normally these vary from 95 to 108 milliequivalents per liter.

3. The carbon dioxide combining power of the serum was ascertained by the technic of Van Slyke and Cullen.[8] Normally this ranges from 23 to 31 milliequivalents per liter.

4. The Musser and Wintrobe [9] procedure was used to measure the whole blood hematocrit values.

RESULTS

The course of each case is presented separately.

CASE 1.—*Hypochloremia refractory to the administration of sodium chloride.*

I. R., a woman aged 65, was subjected to an abdominoperineal resection of a rectal cancer. On the day of operation her serum protein level was 6 Gm. and fell to 5.5 Gm. per hundred cubic centimeters within the next few days (chart 1 *A*). From the fourth postoperative day she appeared dehydrated and complained of anorexia, muscular pains and progressive abdominal distention. The symptoms became more severe during the next eighteen days. In this period she was given daily an average of 3,000 cc. of fluid, 18 Gm. of sodium chloride, 75 Gm. of dextrose but no protein. At the end of this period the serum chloride concentration was only 80 milliequivalents per liter, the protein level was 5.3 Gm. per hundred cubic centimeters and the carbon dioxide combining power was 43 milliequivalents per liter. Throughout the period of observation the fluid intake of the patient was always about 1.3 liters a day greater than the urine output.

On the twenty-third postoperative day the patient died of pulmonary embolism.

Throughout the course hypoproteinemia persisted. To test the possibility that the reduced serum protein concentration had limited the ability of the administered saline solution to raise the chloride level, the following cases were studied:

CASE 2.—*Hypochloremia which subsided when the patient took an adequate diet.*

T. Y., a woman aged 56, underwent a radical resection of a rectal cancer. For eight days before operation she was given a low protein diet, and in this time the protein level of her serum had fallen from 7.4 to 6.7 Gm. per hundred cubic centimeters. The concentration of serum chloride remained between 102 and 105 milliequivalents per liter. By the third postoperative day she complained of nausea and anorexia. She appeared dehydrated and had considerable abdominal distention. The serum protein level had fallen to 5.7 Gm. per hundred cubic centimeters. Despite the previous administration of about 15 Gm. of sodium chloride a day the serum concentration of chloride was only 86 milliequivalents per liter and the carbon dioxide combining capacity 36 milliequivalents per liter. A comparison of the fluid intake to urine output suggested water retention (chart 1 *B*).

Adequate amounts of protein first were given by mouth four days after operation, and within three days from that time

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From the Memorial Hospital for the Treatment of Cancer and Allied Diseases.

Dr. Ariel is trainee in diagnosis and treatment, National Cancer Institute Fellow; Dr. Abels is Finney-Howell Fellow.

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the daily diet contained 80 Gm. of protein (casein) and 350 Gm. of carbohydrate. On this regimen she improved considerably: the abdominal distention and other symptoms subsided, the urinary output approximated the volume of fluid intake and the hypochloremia and alkalosis disappeared (sodium chloride 96 milliequivalents and carbon dioxide combining capacity 28 milliequivalents per liter). Associated with these changes the serum protein level returned to normal. Throughout her course the hematocrit value was not altered significantly.

CASE 3.—*Hypochloremia refractory to sodium chloride but successfully treated by parenteral plasma protein.*

J. S., a woman aged 54, underwent a subtotal gastrectomy for the removal of gastric ulcers. Before operation the patient had a serum protein level of 6.8 Gm. per hundred cubic centimeters and chloride concentration of 98 milliequivalents per liter (chart 2 *A*). For the first three postoperative days about 2,500 cc. of intravenous fluids, 16.6 Gm. of sodium chloride and 75 Gm. of dextrose were given daily. In addition, on two occasions 250 cc. of plasma (equivalent in all to about 35 Gm. of plasma protein) was administered. In the next seven days

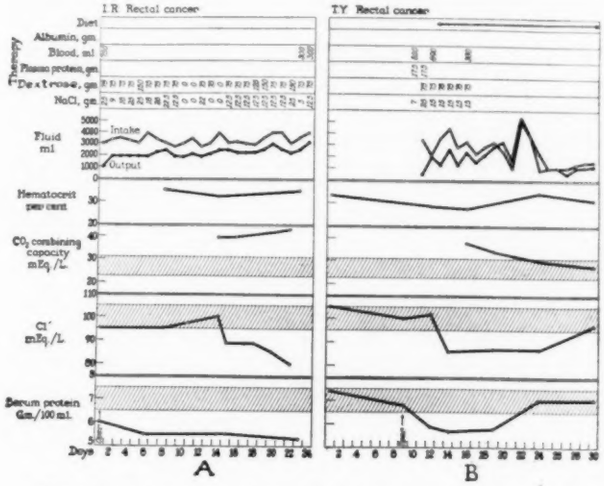

Chart 1.—Laboratory readings (*A*) in case 1 and (*B*) in case 2.

the patient gradually became apathetic, occasionally vomited and appeared dehydrated. Pulmonary edema then appeared, followed by the clinical picture of intestinal obstruction.

During this period an average of 3,000 cc. of fluid, 18 Gm. of sodium chloride and 100 Gm. of dextrose were given daily and on one occasion 250 cc. of plasma (17.5 Gm. of protein). The urine volume remained from 1,000 to 2,500 cc. less than her fluid intake, the serum chloride level fell from 105 to 85 milliequivalents per liter, the protein to 5.5 Gm. per hundred cubic centimeters and the carbon dioxide combining capacity increased to 40 milliequivalents per liter.

For the next nine days the patient received daily an average of 28 Gm. of plasma protein or 25 Gm. of serum albumin,[9a] and the daily supplement of about 18 Gm. of sodium chloride in 3,000 cc. of fluid was continued. The serum protein level then increased by the seventeenth postoperative day to 6.7 Gm. per hundred cubic centimeters, the chloride to 94 milliequivalents per liter and the carbon dioxide combining capacity decreased to 33 milliequivalents per liter. At the same time the anorexia, nausea, lethargy, pulmonary edema and abdominal distention subsided.

On the nineteenth day she began to eat a general diet and from that time on made an uneventful recovery.

These results were further evidence that the existence of hypoproteinemia might limit the effect of administered saline solution on the hypochloremia and alkalosis.

Case 4 provided an opportunity to study more carefully the relationship between hypoproteinemia and the lack of response of hypochloremia and alkalosis to the administration of saline solution alone.

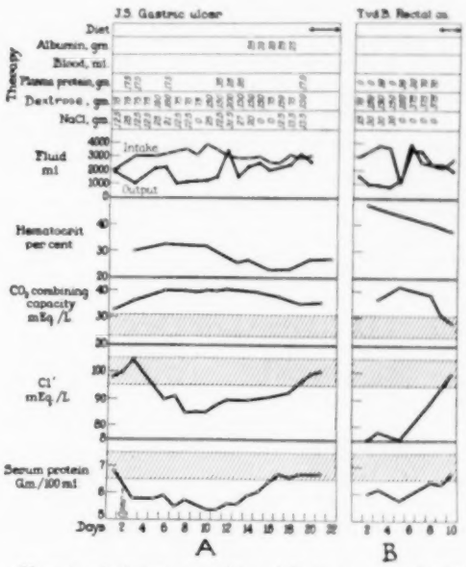

Chart 2.—Laboratory readings (*A*) in case 3 and (*B*) in case 4.

CASES 4 and 5.—*Hypochloremia refractory to sodium chloride but responding to plasma proteins alone.*

T. V. d. B. (case 4), a man aged 46, three months previously had an abdominoperineal resection of a rectal carcinoma. For five days he had taken no food, had severe abdominal cramps and vomited about once each day. The abdomen was considerably distended and the physical findings with a roentgenogram of the abdomen suggested the presence of intestinal obstruction.

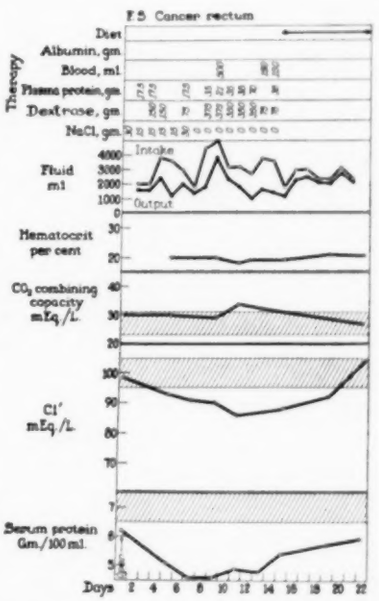

Chart 3.—Laboratory readings in case 5.

Because the patient appeared dehydrated and had a hematocrit level of 48 per cent, it was reasonable to believe that the amount of circulating serum protein was considerably less than the figure of 6 Gm. per hundred cubic centimeters would imply. The chloride level was 75 milliequivalents and the carbon dioxide combining capacity 38 milliequivalents per liter (chart 2 *B*). Although it was recognized that serum protein was probably required, nevertheless an attempt was made to restore the levels of serum chloride and carbon dioxide combining capacity to normal by administering intravenously to the patient each day for the next four days about 3,000 cc. of fluid, 30 Gm. of sodium chloride and 150 Gm. of dextrose.

The desired effect was not produced and the serum protein level fell to 5.7 Gm. per hundred cubic centimeters.

9a. Obtained through the courtesy of Dr. Edwin J. Cohn, Department of Physical Chemistry, Harvard Medical School.

For the next four days the patient was given no further sodium chloride but received intravenously from 35 to 70 Gm. of protein and about 375 Gm. of carbohydrate a day. A considerable diuresis occurred, the serum chloride rose to 94 milliequivalents per liter, the carbon dioxide combining capacity fell to 32 milliequivalents per liter, the concentration of protein increased to 6.4 Gm. per hundred cubic centimeters and the hematocrit value fell to 40 per cent. Simultaneously the patient's appetite improved, the colostomy again functioned and the abdominal distention subsided. After a normal diet was taken for only two days the serum concentration of protein further increased to 6.7 Gm. per hundred cubic centimeters, that of chloride to 99 milliequivalents, and the carbon dioxide combining capacity returned to the normal value of 28 milliequivalents per liter.

In case 5 hypochloremia likewise was refractory to the administration of saline solution alone but was relieved by the subsequent administration of plasma proteins:

F. S., a woman aged 64, was admitted to the hospital for the radical excision of a rectal cancer. For six days after the operation she received daily from 15 to 30 Gm. of sodium chloride, from 2 to 4 liters of fluid and on three occasions only 17.5 Gm. of plasma protein (chart 3). During this interval her serum concentration of protein fell from 6.2 to 4.6 Gm. per hundred cubic centimeters, the chloride from 99 to 89 milliequivalents per liter and the carbon dioxide combining power remained at 30 milliequivalents per liter. The patient became somnolent and continuously nauseated, appeared dehydrated and had considerable abdominal distention. Further administration of sodium chloride then was withheld, and during the next week she received from 21 to 70 Gm. of plasma proteins a day (average 33 Gm. a day). On this regimen the patient's appetite increased and her abdominal distention subsided. By the fourteenth postoperative day she was eating 80 Gm. of protein and 250 Gm. of carbohydrate daily, and five days later the serum protein was 5.7 Gm. per hundred cubic centimeters, the chloride 105 milliequivalents, and the carbon dioxide combining power 26 milliequivalents per liter. No significant changes in the hematocrit value were noted, but a gradual increase in the urine output occurred.

COMMENT

From the data at hand it is unclear whether the chloride imbalance in the cases studied was due actually to loss of electrolyte and water in perspiration at the time of operation, to the occasional vomiting, to the loss of electrolyte in the urine or to some abnormality of the mechanisms concerned with the maintenance of electrolyte distribution. Irrespective of which of these factors was the initiating one, it appears that the hypoproteinemia limited definitely the ability to correct the hypochloremia by the administratioin of isotonic solution of sodium chloride alone.

There now is adequate proof that the retention of fluids and crystalloids in the circulation depends in large part on the concentration of protein in the plasma.[5] If hypoproteinemia exists, much of the water and sodium chloride administered intravenously may be deposited in the tissues,[10] with an increase of the intercellular fluid volume.

The alkalosis found in the studies here reported to be associated with the hypochloremia may aggravate the fluid and electrolyte imbalance by increasing the intracellular retention of water. The infusion of large quantities of isotonic solution of sodium chloride containing 0.25 milliequivalents of sodium bicarbonate (to maintain the normal acid-base balance of the blood) has been demonstrated in animals to induce an edema which was exclusively extracellular. However, when an excess of sodium bicarbonate was added to the infused solution a far more severe type of edema was effected, for one third of the administered water was deposited intracellularly.[11]

Measurements of the intercellular fluid volume of the tissues were not possible in the present study because of the gravity of the patient's condition. If this had increased after the administration of saline solution because of a shift of crystalloids and fluid from the plasma to account for the hypochloremia noted, then it would be reasonable to expect that a return to a normal electrolyte equilibrium would be associated with a loss of water from the body. This actually was found to be the condition in those patients who were treated successfully by the administration of protein. Either a severe diuresis or a gradual decrease of fluid retention occurred.

Since the hematocrit values were not observed to rise significantly after protein therapy, the increased levels of serum chloride and protein evidently were true increases and not due to hemoconcentration consequent to the diuresis.

The malaise, anorexia, somnolence, lethargy and muscular pains of which the patients complained are all symptoms commonly associated with alkalosis. The progressive abdominal distention, pulmonary edema and in some instances peripheral edema were the result of the intracellular and extracellular fluid retention caused by the hypoproteinemia and alkalosis. It has been demonstrated[12] in dogs with an experimental hypoproteinemia that the consequent edema of their gastrointestinal tracts results in prolonged gastric emptying time and general hypomotility of the intestine. In 2 of the 5 cases the intestinal hypomotility and abdominal distention were so severe that a diagnosis of mechanical intestinal obstruction was made and measures for its relief were instituted.

CONCLUSIONS

1. Five patients had postoperatively hypochloremia which was resistant to the administration of large amounts of saline solution.

2. The hypochloremia of these patients was associated with hypoproteinemia. In those instances in which the level of serum protein was increased therapeutically, the disturbed electrolyte equilibrium was corrected.

3. The existence of hypoproteinemia may seriously prevent the correction of the chloride imbalance by the administration of saline solution alone.

4. Alkalosis was regularly associated with the syndrome and may have contributed to its severity.

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Clinical Notes, Suggestions and New Instruments

THE DIAGNOSTIC VALUE OF SMEARS FROM PURPURIC LESIONS OF THE SKIN IN MENINGOCOCCIC DISEASE

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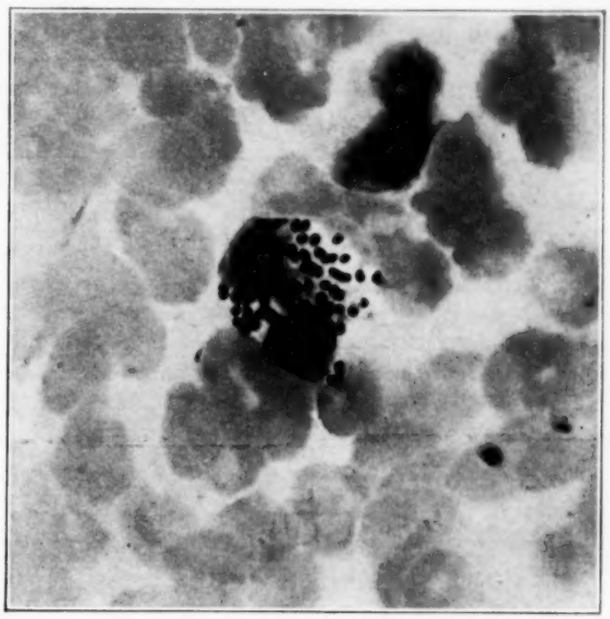
My purpose in this communication is to describe an aid in the diagnosis of meningococcic disease. This aid, the study of smears from purpuric skin lesions, while not new, is not widely used nor fully appreciated. It has particular application in outbreaks among military personnel in view of the high incidence of cutaneous lesions among them.

In January 1943, during an outbreak of meningococcic disease, a patient was admitted to the infectious disease ward of this hospital in coma. She presented fever, leukocytosis, meningeal signs and a petechial type of cutaneous lesion over the extremities and axillary region. The cerebrospinal fluid was cloudy and contained neutrophils but no bacteria. Cultures of cerebrospinal fluid and blood were sterile. The patient was treated with sulfadiazine and made an uneventful recovery.

In reviewing her case we were surprised to find that the organism believed to be responsible for her illness, namely the meningococcus, had not been seen or cultured. Other cases had also shown negative blood cultures when every precaution was taken to insure optimal conditions. Many of these cases had presented purpuric or petechial skin lesions, a thing we had come to associate with meningococcemia. At that time the incidence of skin lesions in meningococcic disease in our series was very high, being present in about 75 per cent of the cases. A similar incidence of skin lesions was occurring in outbreaks among military personnel elsewhere. It was postulated that the skin lesions were seeded during an episode of transient bacteremia, which had then subsided, leaving the bacteria isolated in the skin. That the organisms had been recovered by culture from petechiae was known from the work of Muir.[1] Therefore a series of petechial purpuric and macular lesions occurring in patients with suspected meningococcic disease were studied by smear. McLean and Caffey,[2] working on children, in whom skin lesions were also prone to occur during meningococcic infection, were able to demonstrate diplococci on smear in 80 per cent of their series of 18 cases. Our observations amply confirmed their results.

TECHNIC

After the site had been prepared with alcohol, a fold of skin was pinched between finger and thumb so as to blanch the surrounding tissue and to place the purpuric spot atop the fold. A superficial puncture was made in the lesion by inserting the point of a Hagedorn needle to the depth of the lesion and removing it with a "picking" motion. (A small hypodermic needle or a Bard-Parker 11 blade mounted in a cork served as well.) Then without release of the pinching pressure, more pressure was applied to squeeze out some blood and tissue juice from the lesion. The small drop secured was picked up and smeared by placing a glass slide against it. The smears were 3 to 4 mm. in diameter and several were taken from each of several lesions. Small contact smears were easier to scan and proved to be just as likely to contain organisms as larger ones. The pinching pressure was not released until the smear was taken, lest peripheral blood well up in the puncture wound, diluting the tissue juice of the lesion proper. (It must be remembered that the fluid obtained depends on the accuracy of the puncture, and quantity is not an object.) The smear was then stained with Giemsa's or Wright's stain or by Gram's method and was examined under the oil immersion lens of a microscope. The neutrophils in the smear were scanned for intracytoplasmic diplococci. These were easily found if present, and more than a single pair of organisms were usually found in the cell (as shown in the photomicrograph). We found that Gram stained preparations were tiring to study because the cells were stained pink, and leukocytes were not readily identified. In preparations stained with Wright's or Giemsa's stain the leukocytes stood out and the organisms stained blue black. Dilute Giemsa stain (1 part of stock to 50 parts of buffer at p_H 7.2) after methanol fixation of the smear was especially suitable, since a ten minute staining period brought out leukocyte nuclei and bacteria without heavily staining the leukocyte cytoplasm or the erythrocytes. Both Wright's and Giemsa's stains had the disadvantage that they did not permit one to establish the Gram negativity of the organism. This was more than made up for by the ease of examination. When there was doubt the preparation could be speedily decolorized with methanol and restained by Gram's method. The characteristic biscuit shape of the organism was distinctive in most cases. It was found necessary to ignore as possible contaminants all extracellular organisms.



Intracytoplasmic diplococci in a neutrophil. From a smear of a purpuric skin lesion; × 400.

RESULTS

Positive cutaneous smears were obtained in 39 of 48 cases (about 80 per cent). If the skin smear showed intracytoplasmic diplococci in neutrophils, the corresponding blood culture often grew meningococci. Several exceptions occurred in which the blood culture was negative when the skin smear was positive. In many of these cases the organism was seen or cultured from the cerebrospinal fluid; in others the presence of purulent cerebrospinal fluid made it probable that the cases were of meningococcus origin. In 4 cases the only evidence of the etiologic agent was found in the skin smears. In these the clinical picture was that of typical meningococcic disease. The table illustrates the laboratory findings in this series of cases. It can be seen that 19 cases fell into the group of meningococcic disease without meningitis (about 40 per cent). This was a fortuitous sample, yet it approximates the experience of this hospital's whole series. This larger series is to be the subject of a communication at a later date.[3]

It became apparent that smears of skin lesions were a valuable diagnostic adjunct. They were reported within twenty minutes and were the means of obtaining provisional confirmation of clinical diagnosis in many cases long before cultures were reported. They were especially useful when the cerebrospinal fluid was normal.

From Station Hospital No. 1, Fort Jackson, S. C.

Lieut. Col. O. B. Mayer and Capt. Sidney Selkovits gave access to patients under their care and Mrs. Ruth Austin furnished technical assistance.

1. Muir, R.: J. Roy. Army Corps **33**: 404, 1919, cited in Topley, W. W. C., and Wilson, G. S.: Principles of Bacteriology and Immunity, ed. 2, Baltimore, Williams & Wilkins Company, 1936, p. 1133.

2. McLean, Stafford, and Caffey, John: Endemic Purpuric Meningococcus Bacteremia in Early Life: The Diagnostic Value of Smears from he Purpuric Lesions, Am. J. Dis. Child. **42**: 1053-1074 (Nov.) 1931.

3. Mayer, O. B., and Selkovits, Sidney, to be published.

While positive skin smears were reliable, negative smears were of no significance, as shown in the table. Many negative skin smears were obtained on lesions suggestive of erythema multiforme, punctate hemangiomas, purpura simplex, acne and "chigger" bites. These were not included in this series. The limitations of skin smears were especially apparent in cases in which there were tiny petechial lesions or macules. In general, the larger the petechial and purpuric lesions the easier it was to find diplococci. The macular lesions were distributed over the chest and abdomen and were easily blanched by pressure. The petechial and purpuric lesions, in contrast, were found chiefly about the extremities and the axillary folds and were not blanchable. The macules were common in these cases either as pure forms or as occurring with other lesions. While they always were regarded with suspicion, smears taken from them failed repeatedly to show diplococci even when the blood cultures were positive for meningococci. If cases with macular lesions were excluded from our series the percentage of positive results by skin smears would exceed 90.

Laboratory Findings in a Series of Forty-Eight Cases of Meningococcic Disease Presenting Skin Lesions

	Number of Cases						
	10	15	4	10	4	4	1
Cerebrospinal fluid *...	+	+	+	—	—	—	—
Blood culture.....	+	—	—	+	—	+	—
Skin lesion smear.....	+	+	—	+	+	—	—

* Listed as negative when cell count was normal and culture was sterile; as positive when either was abnormal.

Since these cases were collected, smears of skin lesions have continued to be of service to the clinicians and have proved to be a useful supplement to blood culture.

SUMMARY

Smears taken from purpuric and petechial skin lesions were found to offer a valuable rapid diagnostic adjunct in an outbreak of meningococcic disease among military personnel.

Council on Pharmacy and Chemistry

NEW AND NONOFFICIAL REMEDIES

THE FOLLOWING ADDITIONAL ARTICLES HAVE BEEN ACCEPTED AS CONFORMING TO THE RULES OF THE COUNCIL ON PHARMACY AND CHEMISTRY OF THE AMERICAN MEDICAL ASSOCIATION FOR ADMISSION TO NEW AND NONOFFICIAL REMEDIES. A COPY OF THE RULES ON WHICH THE COUNCIL BASES ITS ACTION WILL BE SENT ON APPLICATION.

AUSTIN E. SMITH, M.D., Secretary.

POISON IVY EXTRACT (See New and Nonofficial Remedies, 1943, p. 48).

The following product has been accepted:

HOLLISTER-STIER LABORATORIES, SPOKANE, WASH.

Poison Ivy Extract: Packages of five ampuls, each containing 0.2 cc. of alcoholic extract, with five ampuls of sterile salt solution for dilution immediately before administration.

Ten Gm. of mature leaves of Rhus toxicodendron are dried, pulverized and extracted seventy-two hours in 100 cc. of absolute ethyl alcohol. The extract is decolorized and sterilized by filtration.

POISON OAK EXTRACT (See New and Nonofficial Remedies, 1943, p. 49).

The following product has been accepted:

HOLLISTER-STIER LABORATORIES, SPOKANE, WASH.

Poison Oak Extract: Packages of five ampuls, each containing 0.2 cc. of alcoholic extract, with five ampuls of sterile salt solution for dilution immediately before administration.

Ten Gm. of mature leaves of Rhus diversiloba are dried, pulverized and extracted seventy-two hours in 100 cc. of absolute ethyl alcohol. The extract is decolorized and sterilized by filtration.

DEHYDROCHOLIC ACID (See New and Nonofficial Remedies, 1943, p. 322).

The following dosage form has been accepted:

SMITH-DORSEY CO., LINCOLN, NEB.

Tablets Dehydrocholic Acid: 0.25 Gm. (3¾ grains).

Council on Physical Therapy

THE COUNCIL ON PHYSICAL THERAPY HAS AUTHORIZED PUBLICATION OF THE FOLLOWING ARTICLE. HOWARD A. CARTER, Secretary.

PHYSICAL THERAPY IN PSYCHIATRIC PRACTICE

WINFRED OVERHOLSER, M.D., Sc.D.
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WASHINGTON, D. C.

The interest of psychiatrists in physical therapy perhaps antedates that of any other medical specialty. This is particularly true of that form of physical therapy known as hydrotherapy; in hippocratic times baths were used for treating mental patients and during the Renaissance the noyade, a rather drastic form of hydrotherapy, was frequently employed. There is probably no mental hospital in the country today which does not have some hydrotherapeutic installation, and the continuous tub and the wet sheet pack have long been standard procedures in such hospitals. Perhaps too the earliest therapeutic uses of electricity were those in connection with psychiatric practice, even though the effects of the static spark and more recently of the faradic current in connection with the treatment of the neuroses were largely suggestive rather than primarily physical.

Physical therapy and psychiatry have labored under rather similar difficulties in that they are both newly recognized specialties of medicine even though their practice is old. Both have developed rapidly; the former has learned much of the various modalities and their effects, the latter of mental mechanisms and their psychosomatic relationships. One point which has gained general recognition is that the patient is a unity, that the mind is not separate from the body, that what one calls mental is but another aspect of the functioning of the whole organism. The manner in which the integrated organism functions and in which its various organs operate affects the emotional state of the patient; the converse is equally true. As knowledge of the bodily factors in mental states has developed, the utilization of physical therapy in psychiatric practice has gained. In addition to the direct effect on various bodily organs and organ systems, however, an effect is exerted on the whole patient by anything which modifies his physical environment, whether this is within his body, on the surface of his body or in the world about him. It is these effects on the whole patient which are referred to as psychologic.

One of the forms of psychologic treatment is known as suggestion. The old fashioned family doctor, whose very entrance into the room breathed assurance and optimism and who made his patient feel better immediately, has long been a byword. Strangely enough, however, the textbooks and many articles which deal learnedly with the effects of the various forms of physical therapy on blood pressure, circulation, secretory activity and other functions of the organs fail almost totally to mention this important psychologic aspect of physical medicine. Just as in the time of Mesmer and his magnets, various phenomena were observed in

patients which are now recognized as having been due entirely to suggestion; this fact has unfortunately been seized on occasionally by the less scrupulous. The imposing static machine and some of the more recent types of apparatus, particularly those designed by quacks to impress the unwary, are potent instruments of suggestion. Physical medicine has had to fight against the idea that it is quackery, and it has had to set standards of apparatus and standards of education and practice, tasks which have been extremely well carried out. The quack gives positive assurance, and the more of a quack he is the more positive the assurance. This is precisely what some patients need. When assurance is combined not only with a strong personality but with imposing apparatus, whether that apparatus is soundly constructed or designed merely for appearances, a psychologic effect is readily produced. Under the control of the qualified practitioner this effect can be a powerful asset.

It should be emphasized that it is not a criticism of physical therapy or of any other reputable branch of medicine that it produces psychologic effects. The tangible effects of the various procedures employed by physical medicine are demonstrable and well known. The fact that there are positively suggestive effects at the same time simply reinforces the local effect of the modality and serves as an adjuvant if one recognizes those effects; by ethical and wise utilization of them the welfare of the patient is promoted and the desired therapeutic result is hastened.

First of all, the patient perceives that something visible and tangible is being done to help him; this in itself is a powerful lever in securing his cooperation and help. He feels reassured and is grateful for the personal attention that is being given to him. Every psychosis or neurosis represents the presence of a conflict in which there is an attempt to satisfy emotional needs, many of them entirely unconscious. Here again the various procedures give an opportunity to gain a certain amount of satisfaction of these needs. Conversely, there may be emotional conditionings which should be taken into account in dealing with the patient, conditionings which may cause him to be fearful of certain procedures. For example, a patient who has had a narrow escape from drowning may become fearful in the presence of a prolonged bath, whereas he might not have the same feeling toward a wet sheet pack. The attitude with which the patient approaches the treatment, therefore, and that with which the therapist approaches it will have much to do with the effect on the patient. This is true in general practice; it is even more important in a mental hospital.

In psychiatric practice two general classifications of physical therapy may be made. One includes the types which are prescribed primarily on account of the total behavior of the patient, that is, on account of his mental condition; such are, for example, the continuous bath and the wet sheet pack for states involving tension, overactivity and restlessness, and the various forms of stimulative therapy, such as the contrast douche, the salt glow, the friction rub and ultraviolet therapy, which may be utilized in states of depression and decreased motor activity. In the other group are included numerous other forms of physical therapy which are useful even though they are directed toward systemic conditions or the conditions of particular organs. The latter group of modalities likewise have a beneficial effect on the mental state of the patient, although this effect may be referred to as in some ways a by-product.

SEDATIVE HYDROTHERAPY

Continuous Bath.—Of the forms of physical therapy prescribed for primarily psychiatric reasons, the form which is by far the most commonly used is the continuous neutral bath. For reasons of economy of personnel the continuous bath suite should contain several tubs rather than a single one. The walls should be of a neutral tint, such as green or gray. The usual tub is large, usually about 33 by 78 inches and about 20 inches deep. It is equipped with four or more inlets in order that the flow of water may be assured, with buttons for the attachment of a hammock and with a 4 inch outlet in order that the tub may be emptied rapidly in an emergency. A thermostatic mixing valve should be used, but the attendant, who should always be present in the room, should utilize a bath thermometer frequently and should occasionally test the temperature of the water with his hand as well. The use of a hammock adds somewhat to the comfort of the patient, although it is not essential. Opinions differ on the value of a tub cover. A cover which is firmly fastened is likely to give a feeling of imprisonment to the patient and sometimes encourages active resistance rather than sedation. Ordinarily a sheet will serve the purposes of warmth and modesty. The room should preferably be not too light, and it is better to have the tubs separated by movable screens. The temperature of the water is best held at about 94 to 96 F., and a moderate flow should be maintained. Every effort should be made to prevent the variations from being pronounced, and special care must be taken not to allow the temperature to go substantially either higher or lower. The bath may be continued for rather long periods if indicated, and it is doubtful whether much effect is obtained in less than three or four hours. There is no objection to a patient's remaining in a continuous bath for several days without interruption. In a few patients a cutaneous eruption is noted after a period, but this usually responds promptly to emollients. This form of treatment is essentially sedative and therefore is most frequently utilized in conditions of overactivity and restlessness such as may be found in delirium tremens or other deliriums, in dementia paralytica, involutional melancholia, the manic phase of manic-depressive psychosis, disturbed forms of schizophrenia, and even in not too debilitated senile psychoses. As contraindications one may mention pulmonary tuberculosis and exetreme debility.

One of the great advantages of this form of therapy is that it can be used without special equipment, as in the general hospital or in the home. Important precautions to take are those against scalding or chilling and against attempted suicide by drowning. The value of being able to empty the tub quickly in any of these emergencies is obvious. The need of constant supervision in this form of therapy cannot be stressed too strongly.

The use of the warm bath to promote sleep need hardly be elaborated on here.

The Wet Sheet Pack.—Next in point of frequency to the continuous bath is found the wet sheet pack. This is a valuable sedative measure but one which is

not without its dangers, both physiologic and psychologic. A considerable degree of technic is required for the proper application of the pack, and there is some dangers of collapse or heat stroke if the patient is not properly supervised during the administration of the treatment or if the treatment is continued for too long a period. The pack combines the advantages of a vapor bath with enforced immobilization, both of these elements being essentially sedative in effect. Unfortunately in some institutions the indiscreet remarks of attendants have sometimes, by threatening the patient with a pack, given the impression that this procedure is punishment rather than treatment. Such a mental attitude on the part of the patient is likely to result in increased struggling, thus nullifying the sedative value of the treatment. Usually, however, when the therapeutic purpose of the pack is impressed on the patient, there is not only no opposition but an eagerness to accept this form of help.

The amount of equipment required for the wet sheet pack is relatively slight. Preferably a pack table (about 30 inches high) rather than a bed is utilized, and sheets and blankets with safety pins are essentially the only other material needed. The mattress should be firm and should be covered with a rubber sheet. For somewhat debilitated patients the pack may be preceded by a brief warm tub bath or a steam or electric cabinet treatment for the purpose of increasing the circulation in the skin and raising the general temperature of the body. The room should be warm, not less than 70 F., somewhat darkened and quiet, and the walls painted a neutral tint. The sedative effect is heightened if the patient is separated from other patients in the room by screens. The best effects are obtained if the sheets in which the patient is first enveloped are wrung out in water at a temperature of 60 to 70; that is, cool. An extremely vigorous patient may react well to water even slightly below 50 F. A frail patient, on the other hand, requires water of a more nearly neutral temperature, between 92 and 97 F. The secondary stimulation of surface circulaton is heightened with the cooler water. Sheets should always be wet. The dry sheet pack is dangerous and should never be employed. Sheets wrung out in hot water, on the other hand, may scald the patient, and for this reason hot water should not be used.

The patient should be enveloped as rapidly as possible in the wet sheets and then wrapped in blankets to prevent radiation.[1] The proper technic is rather complicated and need not be described here. The successfully applied pack will remain in place with at least a moderate amount of motion of the patient. Suitable care must be exercised to prevent the patient from rolling off the table. In the initial stages of the pack it is desirable that cold be applied to the occiput and forehead, but as soon as the flushing has subsided this may be discontinued. The patient should show substantial sedation and may even go to sleep within about forty-five minutes. If he does not, he should be removed and given a continuous bath instead.

A patient in a pack must be carefully supervised with particular regard to his pulse and to the presence of flushing. If heat stroke appears imminent, he should be removed from the pack immediately. In any event the pack should not be continued more than four hours, as heat exhaustion may take place if it is continued longer. After the patient is removed a brief neutral shower may be given, and he should then be placed in bed and covered warmly for a period of rest. Liquids may be given while the pack is in progress, but the patient should not be fed. A considerable amount of perspiration takes place; one of the advantages of the pack is that it stimulates elimination through the skin. A coperative patient may be placed in a pack by as few as two nurses, but in some instances the services of three or four are necessary.

This is a procedure which may be utilized in the home or in the general hospital, with adequate supervision of trained persons. It is extremely useful in states of disturbance and overactivity, such as those in which the continuous bath may be used. It is more actively sedative and therefore is applicable in some cases in which the continuous bath would not be considered as the first choice. The frequency of prescription, and indeed of prescription at all, will depend much on the general physical condition of the patient. Pulmonary tuberculosis is generally looked on as a contraindication, as is hyperthyroidism, or any other condition in which cerebral congestion should be avoided.

STIMULATIVE HYDROTHERAPY

Under the general heading of stimulative hydrotherapy one finds a number of procedures, all more or less related and somewhat similar in principle, involving the application of cool water which is under more or less pressure and of various temperatures, accompanied or not by friction. The particular varieties depend in part on the physical condition of the patient and on his general cooperativeness. They are particularly useful in mental conditions characterized by a tendency to inactivity as, for example, in the depressions and those types of schizophrenia in which catatonic features are rather prominent. Some of them, in order to increase the contrast and reaction, may be preceded by a brief period under close observation in the electric bath cabinet or the vapor cabinet. In general, however, these particular forms of the application of heat are of doubtful value in psychiatric practice. Considerable hazard is involved in any event, and with a disturbed patient burns may be incurred.

Douches.—The needle or circular type of douche is in common use. This has the advantage of stimulating the entire surface of the body by the impact of numerous fine jets of water, and the thermal effect may be varied according to the patient's ability to react. The same may be said of the fan and jet douches, which involve somewhat more massive stimulation. One of the most stimulating forms of all is the so-called contrasting or Scotch douche in which two alternating streams of water, one 70 to 80 and the other about 110 F., are applied by a hose under considerable pressure.

Other Forms.—Saline baths are spoken of in the literature, but they are not used with any great generality. The same may be said of the effervescent or so-called Nauheim bath. The applications of the whirlpool bath, although it might be used for its general effect, are more often for localized conditions. Affusions and the drip sheet rub are other forms of stimulative hydrotherapy which may be mentioned.

Salt Glow and Friction Rub.—Among other types of physical therapy involving water and friction may be mentioned the salt glow, which consists in rubbing the surface of the skin with damp coarse salt, and cold mitten friction, the operator using either fiber mitts or preferably knitted mittens on his hands. These pro-

1. See page 185 of Handbook of Physical Therapy.

cedures may be applicable in the postdelirious state and may be useful with some of the types of neurosis in which general supportive and stimulative therapy is called for.

Irrigations.—Another form of the application of water is found in the irrigations, such as the enema, the vaginal douche and the colonic irrigation. These procedures are discussed elsewhere in the Handbook.

THE FEVER CABINET

An important form of physical therapy in mental hospitals is found in the use of the fever cabinet. The original work of Wagner-Jauregg in Vienna in 1917, subsequently introduced into the United States at St. Elizabeths Hospital, consisted in malarial inoculation of patients suffering from dementia paralytica. Certain drawbacks to malarial therapy have been mentioned, two of the notable ones being that certain persons are immune to malaria and that the physical condition of others does not permit inoculation with malarial parasites for therapeutic purposes. Accordingly, for a number of years a good deal of investigation has been carried on concerning the artificial induction of fever (diathermy, electric blankets and so on) and several satisfactory types of fever cabinet have rather recently been developed. A certain amount of cooperativeness is requisite on the part of the patient, and close supervision must be exercised at all times by the nurse, who should have special training in this form of therapy.

The patient, without breakfast, is placed in the cabinet, and his temperature (taken continuously by an electric rectal thermometer) is gradually raised to approximately 106 F. It is maintained at this level for about six hours and then is gradually reduced. During the treatment fluids are forced, and the treatment must be followed by prolonged rest. Heat prostration and even death from fever treatment are not entirely unknown, and care must be exercised in the selection of the patient. A total of about fifty hours of fever is administered in conjunction with active chemotherapy. Any contraindication to a major surgical operation is a contraindication to fever therapy. In addition, organic lesions of the brain (other than dementia paralytica), arteriosclerosis, any extensive areas of anesthesia and hepatic disease are all contraindications.

ELECTRIC SHOCK THERAPY

Another form of physical therapy which is highly characteristic of mental hospitals and which indeed should not be employed outside of a hospital is the so-called electric shock therapy. By means of a special apparatus a current of low amperage (300 to 700 milliamperes) may be passed through the brain by means of electrodes applied to the temporal regions while the patient is lying supine in moderate hyperextension. This position is readily obtained through the use of sand bags or pillows or by means of a Gatch bed, the patient lying with his head at the foot of the bed. The current is applied for 0.1 to 0.7 second and immediately causes a convulsive seizure with loss of consciousness. The convulsion lasts approximately one minute, followed by a period of confusion which may last five or ten minutes and by a period of anterograde amnesia. Sometimes impairment of memory is a persistent complaint. During the convulsion the motions of the extremities are best controlled by two or three suitably trained attendants. The treatment has been recommended particularly for the depressions, and in some cases remarkable improvement at least of a temporary nature has been reported. It has also been used occasionally for conditions of overactivity, especially for the manic phase of the manic-depressive psychosis, and with somewhat less success for the various manifestations of schizophrenia. The rationale of the procedure is a subject of speculation.

REFRIGERATION

Some investigation of the effects of low temperature has been carried on in a few psychiatric centers but with dubious results. By means of a specially constructed unit, refrigerated brine is circulated through tubes in a rubber blanket, the patient being thoroughly wrapped in woolen blankets. The general temperature of the body is lowered gradually to about 85 F. or even lower. Some of the hypothermic treatments have lasted forty-eight hours or more. One case of a minimal temperature of 74.6 F. (with survival) has been reported. The procedure is not recommended.

The local effects of cold for cauterization and for local surgical anesthesia are dealt with elsewhere.

OTHER MODALITIES

I have discussed so far the various forms of physical therapy which are prescribed primarily on account of the behavior of the patient and which have psychologic indications. The extent of physical therapy in psychiatric practice, however, is not limited to this recitation. In the course of psychiatric practice either inside or outside a hospital almost any sort of physical condition may become intercurrent or associated and call for physical therapy. For this reason any well equipped psychiatric hospital needs to have an active physical therapy department and to be prepared to administer such of the well known modalities as short wave and surgical (electrocoagulation) diathermy, infra-red and ultraviolet radiation, and polysine.

The private practitioner in the field of psychiatry too will often have occasion to utilize the tools of physical therapy for both general and specific effects. Massage should be available for its local effects on disabled joints and muscles and for general relaxation as well. Reference to the other chapters in the Handbook will indicate the range of types of disability which the physical therapy department of a mental hospital is called on to treat. Patients in mental hospitals, in other words, exhibit little difference from patients outside. They are perhaps more susceptible to what may be termed the intangibles—atmosphere, personality, attention to their needs and interest shown in them. This difference, however, is only one of degree. Occasionally they are somewhat less cooperative than the average patient in general practice, and occasionally they are even resistive. Many of them, however, are highly coperative and deeply appreciate all that is done for them. The effects of specific treatment on their general mental health are often startling.

Much can be done to make the physical therapy department attractive. Hangings, pictures, mirrors, plants and even birds and aquariums do much to dispel the formal institutional appearance of the average treatment room. The matter of emphasizing the attention being given to the patient is one which might well be borne in mind in general. Such details of atmosphere do much to promote relaxation, stimulate the cooperation of the patient and put him in a psychologic condition to receive the maximum benefit from his treatment.

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SATURDAY, SEPTEMBER 4, 1943

WAGNER-MURRAY-DINGELL BILL

Hearings on the Wagner-Murray-Dingell bill, which was fully analyzed by the Bureau of Legal Medicine and Legislation of the American Medical Association and commented on editorially in THE JOURNAL, June 26, will no doubt be held in the near future, probably after Congress has completed the new tax bill. According to the *United States News*,[1] advocates of the expansion program for social security assert that it has caught the popular fancy, that pressure for its adoption is increasing daily, that the plan is a big step toward one of the Four Freedoms of the Atlantic Charter—Freedom from Want—and that Congress would face a storm of public criticism if it failed to approve the main provisions of the plan. On the other hand, opponents assert that the program would constitute a capital levy of ruinous magnitude on United States business, that even with the 12 per cent payroll tax the plan would be underfinanced, and that, should Congress enact such a bill, a dominant bureaucracy would be created which would end free enterprise in the United States and alter the whole way of American life.

The editorial published in THE JOURNAL on June 26 emphasized that this bill is an evolution of the National Health Conference of 1937. It pointed out further that the measure was prepared without consultation with the medical profession, that it would make the Surgeon General of the United States Public Health Service a virtual "gauleiter" of American medicine and that it would be, in fact, the acme of bureaucratic control of medical service. In the two months that have passed there has been a mustering of medical and public opinion against this measure, indicating awareness by the medical profession and the public of the tremendous stake that they have in this legislation. The editor of the McKeesport (Pa.) *Daily News* states the case succinctly:

> It would place the doctors under political control and provide for the mass of the people physicians who are politically amenable rather than those with superior abilities and skills. And would deaden one of the most highly regarded professions the world has ever known. . . . Success of bill 1161 and the destruction of the freedom of American medicine would be the come-on for other broader, more revolutionary schemes to circumscribe the American people.

The periodical *America*[2] says, in a statement by one of its editors:

> Now, will public regimentation of health servants operate to preserve the profession and thus ultimately help to preserve the body politic? It seems that such action—as, for example, that contemplated in Senate bill 1161—would create a new class of political doctors. And in America political classes are commonly subject to the influence of political practice, in seeking emoluments and avoiding burdens, unless we take the rare case of the unusually elevated individual. The system as it works does not raise personal ideals. But doctors without high personal ideals are a menace, both to the patient and to the public.

An editorial in the Middletown (Ohio) *News Signal* says:

> The Wagner bill will be considerably modified, but some of its worst features may become law unless it is seen in its true light. It is part of a program, now well advanced, to enslave the individual to the state. In this process he gradually loses his adult self reliance, lapses toward infancy and then degenerates into a willing slave of government.

The Charleston (S. C.) *News-Courier*, in a sarcastic editorial contribution, emphasizes the political aspects of this measure. It suggests that the medical administrators under the Wagner-Murray-Dingell bill be elected by popular ballot. The medical administrator would have the right to appoint the doctors and assign the cases. He could expect the support of the doctors that he appointed to help him get reelected, and the doctors would use their automobiles and C cards to help haul voters to the polls. They could also contribute to a fund to buy radio time for campaign speakers. Any doctor who worked against the medical director's reelection might find it difficult afterward to practice. Appointments in the medical colleges would, of course, be handled like other political patronages so that deserving party members could have their sons trained free of charge. Incidentally, it is pointed out, a lot of useful confidential information could be picked up by the doctors on their rounds that would help the party to stay in office.

And the Jackson (Tenn.) *Sun* comments metaphorically:

> We are indeed a sick nation if we are willing to swallow such a pill. After swallowing it we would find that, instead of taking a progressive stimulant, we had taken a political opiate intended to dull our senses. . . .

The editor of the Buffalo *News* suggests that the proposed measure provides for a setup "closely approaching that in the totalitarian nations." He urges, furthermore,

1. United States News **15**: 46 (Aug. 27) 1943.

2. America, Aug. 21, 1943, p. 543.

that the people, if they have put upon them the full measure of social security proposed by the New York senator, "soon would be in a condition to yield themselves up as wards of the state."

At its meeting held in Chicago on August 26 the American Bar Association gave its approval to a resolution opposing any legislation now before Congress which "seeks to establish Federal control of the medical profession and the regimentation of doctors and hospitals."

The periodical *Medical Care*,[3] edited by Mr. Michael Davis, suggests that the Wagner-Murray-Dingell bill was introduced on the demand of organized labor for the expansion of social security and that the timing may be accounted for by the probability that realists who are pushing this bill are more hopeful of dramatizing an issue for 1944 than of congressional action this year. The editorial indicates, incidentally, that the bill goes beyond the plans put forth by the President and the Social Security Board.

In his editorial Mr. Michael Davis suggests that American physicians can now be divided into three groups: those who support the policies of the American Medical Association, those who differ with them but who keep silent and those who differ and say so publicly. Mr. Davis takes great encouragement from the statement recently released by Drs. John Peters, Channing Frothingham and others which apparently indicates to him a division in the medical profession and a gathering of strength against the policies of the American Medical Association.

Already an announcement has been made in the press that Senators Wagner and Murray propose to have early hearings on this measure. Certainly the Board of Trustees and the newly established Council on Medical Service and Public Relations will give early consideration to the manner in which the American Medical Association is to be efficiently represented in the proposed hearings.

Regardless of any other considerations on which there might be a difference of opinion among the vast majority of physicians of the United States, unity is demanded in the attack on the technic for rendering medical service proposed by the Wagner-Murray-Dingell bill. Senator Wagner in his public statement said "I do not claim this bill is in any sense a perfect instrument; it is offered simply as a basis for legislative study and consideration." Let us take the Senator at his word and prove to him and his colleagues, by a complete and forceful presentation of the points of view of American medicine, how far from perfect is the measure that he has proposed.

3. Medical Care **3**: 257 (Aug.) 1943.

BLADDER TUMORS AND URINARY CARCINOGENS

The observations that epithelial tumors of the urinary bladder are often multiple and that they show a remarkable tendency to reappear after removal, under circumstances that make it unlikely that the new tumors are either recurrences or local implantation metastases, have suggested to many the possibility that this epithelium in some persons is subjected to strong carcinogenic factors. It is uncertain what these factors are in the majority of patients with bladder tumors. In a few the cancers are due to chemicals, probably exogenous in nature, which are being excreted in the urine, as has been known since Rehn [1] in 1895 described tumors of the bladder in workers with aniline dyes. Possibly a few are induced by arsenic.[2] The total number of aniline dye tumors of the bladder collected from the world's literature is over five hundred.[3] They therefore constitute a real therapeutic problem. But of greater importance is the principle which they illustrate, namely that bladder tumors can be induced by products excreted in the urine. Davis [4] has recently suggested that other chemicals commonly present in the environment might be additional causes of cancer of the bladder.

The possibility that endogenous chemicals, formed in the body and excreted in the urine, also might cause bladder cancer must also be considered in view of the report by Steele, Koch and Steiner [5] claiming that carcinogenic activity has been demonstrated in extracts of human urine.

One argument sometimes advanced in attempts to minimize the importance of the aniline dyes as causes of bladder tumors is that they are not accompanied by an excessively great incidence of tumors higher in the urinary tract as might be expected if they were due to a substance being excreted by the kidney. This argument has lost its force since it has been shown by Hueper, Wiley and Wolfe [6] that dogs fed or injected with beta-naphthylamine develop tumors of the urinary bladder and not of the kidney, while Sempronj and Morelli [7] produced kidney tumors and no bladder tumors by the injection of beta-anthraquinoline. Other dyes have also induced tumors of the bladder.[3] These experiments illustrate high biologic selectivity.

Why certain substances which are generalized in the body should select the mucosa of the urinary bladder

1. Rehn, L.: Blasengeschwülste bei Fuchsin-Arbeitern, Arch. f. klin. Chir. **50**: 588, 1895.

2. Goeckerman, W. H., and Wilhelm, L. F. X.: Arsenic as the Cause of Cancer of Mucous Membrane, Arch. Dermat. & Syph. **42**: 641 (Oct.) 1940.

3. Hueper, W. C.: Occupational Tumors and Allied Diseases, Springfield, Ill., Charles C Thomas, 1942, chapter 5.

4. Davis, Edwin: Chemical Carcinogenesis, Drugs, Dyes, Remedies and Cosmetics with Particular Reference to Bladder Tumors, J. Urol. **49**: 14 (Jan.) 1943.

5. Steele, Robert; Koch, F. C., and Steiner, P. E.: The Extraction of a Carcinogenic Fraction from Human Urine, Cancer Research **1**: 614 (Aug.) 1941.

6. Hueper, W. C.; Wiley, F. H., and Wolfe, H. D.: Experimental Production of Bladder Tumors in Dogs by Administration of Beta-Naphthylamine, J. Indust. Hyg. & Toxicol. **20**: 46 (Jan.) 1938.

7. Sempronj, A., and Morelli, E.: Carcinoma of the Kidney in Rats Treated with Beta-Anthraquinoline, Am. J. Cancer **35**: 534 (April) 1939.

and others the kidney for their carcinogenic action is no less, but probably no more, mysterious than why digitalis selects the heart, morphine the central nervous system or hormones their specific tissues for their actions.

The examples of chemically induced bladder tumors taken together with the older knowledge of bilharzia induced bladder tumors form an opening wedge in the solution of the causes of this type of cancer. A thorough investigation directed toward the discovery of additional possible chemical causes of bladder cancer, keeping in mind the possibility of both exogenous and endogenous carcinogens, appears highly desirable. It might become possible to prevent such tumors by prophylactic measures.

Current Comment

ADMINISTRATION VS. MINISTRATION IN MEDICAL CARE

Legislation transforming the methods of providing medical care has been proposed in Australia, Canada, New Zealand, South Africa and the United States. The discussion of the proposed plans divides into two sharply contrasting streams that may seem to be dealing with wholly different subjects. Politicians, civilian planners, social security officials and propagandists in behalf of collectivization speak and write almost exclusively about the machinery of administration. They are concerned about offices, jobs, the distribution of authority, financial arrangements, political pressure groups and lines of authority. Detailed reports in medical journals of recent discussions by medical associations in all of the countries concerned indicate that physicians are interested primarily in the effects of such plans on the quality of medical service to be rendered. A British physician characterizes this dichotomy of the discussion by saying that political writers and speakers are concerned primarily with "administration," while physicians are interested in "ministration," which, he points out, may be defined as "service." [1] The medical profession is worried about the preservation of the standards of medical education, diagnosis and treatment, maintenance of the type of patient-physician relation that centuries of experience have shown to be most helpful to the sick, and preservation of the initiative, independence and opportunity for research that have been responsible for the marvelous progress of medical science. These are the really important factors in any system of medical practice; certainly all of them will be harmed if placed under political control. To the degree that these essentials of medical practice have been made the responsibility of the medical profession and kept from the control of lay "administrators" have the "ministrations" of medicine grown continuously more effective in the treatment of disease and in the prolongation of human lives.

1. Bourne, Geoffrey: Medicine and Politics, Brit. M. J. **1**: 673 (May 29) 1943.

Rh ANTIBODY IN BREAST MILK

The possibility that Rh antibody is given off in breast milk in sufficiently high titer to cause additional blood destruction in Rh positive infants is suggested by data currently reported by Witebsky and his associates [1] of the University of Buffalo. Trace of Rh antibody in second week breast milk of an Rh negative mother who had given birth to an erythroblastotic child was first demonstrated about a year ago by the same authors.[2] Since then 2 additional cases have been studied in greater detail and at earlier stages after delivery. In the first case the mother, baby and putative father belonged to blood group A. The mother was Rh negative, while both the baby and the father were Rh positive. The mother's serum contained Rh antibody in sufficiently high titer to agglutinate the baby's Rh positive erythrocytes in dilutions as high as 1:256. On the fifth day after delivery (two days after the baby's death) the mother's milk agglutinated Rh positive erythrocytes in dilutions as high as 1:16. Still earlier tests were made with a second erythroblastotic child, in which case the titers of the Rh antibody in the maternal serum and colostrum were the same. This equality suggests that the Rh antibody content of breast milk is at a maximum during the first day after delivery, subsequently decreasing in titer. Assuming that ingested Rh antibodies pass unaltered through the intestinal mucosa to enter the circulation, Witebsky concludes that the colostrum and early breast milk of an Rh negative mother who had given birth to an erythroblastotic child might be a contributory factor in further blood destruction in the Rh positive infant.

REHABILITATION OF THOSE REJECTED FOR MILITARY SERVICE

The selective service registrants who are rejected for military service, especially those who are rejected on neuropsychiatric grounds, constitute a special problem. The state of New Jersey [1] has developed a psychiatric screening plan under the auspices of the selective service system in cooperation with the Department of Institutions and Agencies and with social and health workers throughout the state. This mechanism is designed to collect all the available data bearing on the mental and nervous status and personality of the registrant. Social and health counselors are attached to the local draft boards. A rehabilitation program has been established in cooperation with private as well as public agencies. Following physical and psychologic restoration, young men will be enabled to take their full place in society as citizens and producers. The development of this program together with others of a similar nature will be of help in planning the postwar rehabilitation of many additional men in other areas who will require such assistance.

1. Witebsky, Ernest, and Heide, Anne: Proc. Soc. Exper. Biol & Med. **52**: 280 (April) 1943.
2. Witebsky, Ernest; Anderson, G. W., and Heide, Anne: Proc. Soc. Exper. Biol. & Med. **49**: 179 (Feb.) 1942.

1. Frankel, Emil: Selective Service and the Public Welfare, State of New Jersey Department of Institutions and Agencies, Trenton, May 1943.

MEDICINE AND THE WAR

In this section of The Journal each week will appear official notices by the Committee on War Participation of the American Medical Association, announcements by the Surgeon Generals of the Army, Navy and Public Health Service, and other governmental agencies dealing with medicine and the war, and such other information and announcements as will be useful to the medical profession.

ARMY

DEDICATION OF THE ASHBURN GENERAL HOSPITAL

The U. S. Army Ashburn General Hospital at McKinney, Texas, was formally dedicated on August 12. Among other speakers on the program were Major Gen. Norman T. Kirk, Surgeon General of the Army; Major Gen. Richard Donovan, commanding general of the Eighth Service Command; Hon. J. H. Snapp, mayor of McKinney; Mr. Hansford Ray, president of the local chamber of commerce, and Hon. Sam Rayburn of Texas, speaker of the U. S. House of Representatives.

The 1,530 bed hospital comprises 110 buildings which occupy a total of 270 acres of land and which are constructed in two parallel rows opening onto a common walkway. The buildings are of tile construction. The hospital was completed at a cost of more than $3,000,000.

Col. James B. Anderson, M. C., is the commanding officer, and Col. Clifford A. Gray, M. C., the executive officer. The professional staff as of August 19 was as follows:

MEDICAL SERVICE

Major John Harvey, M. C., chief of the medical service.
Major Theodore L. Bliss, M. C., assistant chief, medical service.
Capt. David M. Kydd, M. C., ward officer.
Capt. Max M. Montgomery, M. C., ward officer.
Capt. Samuel X. Radbill, M. C., ward officer.
1st Lieut. William E. Bloomer, M. C., ward officer.
1st Lieut. Robert A. Major, M. C., ward officer.
1st Lieut. Norman Shaftel, M. C., ward officer.

SURGICAL SERVICE

Major Mordecai D. Tyson, M. C., chief, surgical service.
Capt. Stirling E. Russ, M. C., assistant chief, surgical service.
Major Samuel L. Schenfeld, M. C., ward officer.
Major Sidney J. Silbar, M. C., chief, urology section.
Capt. Casimir Demski, M. C., ward officer.
Capt. William C. Goodlett, M. C., chief, orthopedic section.
Capt. John M. McGowan, M. C., ward officer.
Capt. Herschal H. Pevaroff, M. C., ward officer.
Lieut. John S. Gaynor, M. C., ward officer.
Lieut. Woodrow W. Lovell, M. C., ward officer.

EYE, EAR, NOSE AND THROAT

Major Warren M. Dodge, M. C., chief, E. E. N. T. section.
Capt. Gerson Lowenthal, M. C., assistant chief, E. E. N. T. section.
Capt. Fay M. Whitsell, M. C., assistant chief, E. E. N. T. section.

LABORATORY

Capt. Glenn R. Backus, M. C., chief, laboratory section.
1st Lieut. Joseph H. Akeroyd, Sn. C., assistant chief, laboratory section.
1st Lieut. Matthew A. Bucca, Sn. C., assistant chief, laboratory section.

X-RAY SECTION

Capt. Robert J. Ruby, M. C., chief, x-ray section.

OUTPATIENT SERVICE

Capt. Donald C. Mershon, M. C., chief, outpatient service.

NEUROPSYCHIATRIC SECTION

Major Arthur J. Gavigan, M. C., chief, neuropsychiatric section.

PHYSICAL THERAPY SECTION

1st Lieut. Paul M. Kistler, M. C., chief, physical therapy section.

PRISONER OF THE JAPANESE

According to the Detroit *Free Press*, Capt. Edward R. Nell of the Army Medical Department, formerly of Kalamazoo, Mich., is a prisoner of the Japanese. A card received by his parents in August stating that he was well was the first word from him since the fall of Bataan about seventeen months ago.

LIEUTENANT COLONEL PRATT COMMANDS NEW HOSPITAL IN ENGLAND

A new general hospital in London has been acquired by the United States Army from the British government under reverse lend-lease procedure. The building, which was formerly an infants' hospital, was redesigned by United States engineers and rebuilt by the British Ministry of Works. It is used mainly for the treatment of emergency cases and minor illnesses and is open to members of the Army and Navy, merchant seamen, U. S. Embassy personnel, Wacs and American Red Cross workers.

The commanding officer is Lieut. Col. Henry N. Pratt of Boston, a Harvard graduate and allergy specialist. The executive officer is Major Maurice J. Abrams of Brewton, Ala., a graduate of Johns Hopkins. Major Abrams, formerly an internist on the staff of the University of Maryland, is also chief of medical services. Other department heads are Major Sherwood Russell, University of Maine graduate and former surgeon at St. John's, Mich., who is chief of surgical service, and Chief Nurse Juanita Bronson, a native of Bucyrus, Ohio, and graduate of Grant Hospital, Columbus, Ohio.

The hospital is equipped with the latest technical apparatus, mostly of American design; the general hospital equipment, however, is British. There is a dental clinic and an x-ray department, which is in charge of Capt. Thomas C. Worth of Raleigh, N. C. Capt. Miles Gullingsrud of Three River Falls, Minn., sees that army cooks provide a healthful American hospital diet in food rationed England. Eggs, cereal, fresh milk and vegetables are given by the British under reverse lend-lease, and extra eggs and milk are obtainable for special cases. Patients even get ice cream made from evaporated milk and powdered eggs. Cheerful wards are furnished with American adjustable beds and with large leather chairs provided by Britons. Ice boxes taken from blitzed London apartments serve the post exchange.

WACS TO BE ENROLLED IN ARMY-NAVY HOSPITAL SCHOOL

The War Department announced on August 19 that new opportunities have been opened to members of the Women's Army Corps for training and service in the Army Medical Department. Beginning September 10 the first of more than a thousand members of the WAC will be enrolled in the Army-Navy Hospital School, Hot Springs, Ark., in military hospital training courses. Graduates will be assigned to duty at general and station hospitals. This action is indicative of the opportunities that will present themselves to members of the Women's Army Corps. Each Wac selected to attend the school will be given training in one of five courses. New classes will be started on the tenth day of each month. Three of the courses, those for training x-ray technicians, are of three months' duration. For each of these forty-five women will be selected initially. Courses for training medical and surgical technicians are of two months' duration, for each of which a hundred Wacs will be selected initially. The new field of training now opened to members of the WAC has heretofore been restricted to male military personnel.

AVIATION MEDICAL EXAMINERS

Graduation exercises were held at the School of Aviation Medicine, Randolph Field, Texas, on July 15, following completion of the course for aviation medical examiners. The didactic portion of the course was conducted at Randolph Field, Texas, and the practical portion of the course at the three army air forces classification centers. The list of students graduating follows:

ALABAMA

Charles A. Baumhauer, Captain, Whistler.
Joe H. Little, Major, Mobile.
Keith W. McFatridge, Major, Tuscaloosa.

ARIZONA

Donald Marcus, 1st Lieut., Phoenix.
Harry T. Southworth, Captain, Prescott.

ARKANSAS

Maurice W. Chastain, 1st Lieut., Bentonville.

CALIFORNIA

Dudley Philip Bell, 1st Lieut., Oakland.
Samuel C. Benadom, 1st Lieut., Beverly Hills.
Robert Vernon Carter, 1st Lieut., Tarzana.
John G. Clegg, 1st Lieut., Los Angeles.
Ralph C. Cloninger, 1st Lieut., Los Angeles.
Robert J. Douds, 1st Lieut., Bakersfield.
George J. Ferris, 1st Lieut.. San Francisco.
Lynn Force, Captain, Oakland.
David Frost, 1st Lieut., Woodland.
William L. Gilmore, 1st Lieut., San Francisco.
Edward F. Healey, 1st Lieut., San Francisco.
Lloyd B. James, 1st Lieut., Fresno.
Harold R. Ostrander, Captain, Los Angeles (San Marino).
David P. Winkler, Captain, Los Angeles.

COLORADO

Gaylor R. Chase, Captain, Denver.
Arthur B. Hardy, Captain, Denver.
John W. Hewatt Jr., Major, Denver.
Joseph H. Lyday, Captain, Denver.
Nicholas S. Saliba, Major, Walsenburg.
Henry C. Willumsen, Captain, Colorado Springs.

CONNECTICUT

Stephen P. Coates, Captain, Suffield.
Harold Ira Harvey, 1st Lieut., New Britain.
Edward Martin, 1st Lieut., Rockville.
Henry T. Posey, 1st Lieut., New Haven.
James S. Walsh, Captain, Bridgeport.

DISTRICT OF COLUMBIA

Alexander Halperin, Captain, Washington.
Francisco L. Sureda, Lieut. Col. (Uruguayan Officer) Embassy of Uruguay, Washington.
Sherman A. Thomas, 1st Lieut., Washington.
Redmond B. Walsh, 1st Lieut., Washington.

FLORIDA

Charles R. Burbacher, Captain, Coral Gables.
William Arnold Christian, Captain, Miami Beach.
George H. McSwain, Captain, Arcadia.
Efton J. Thoms, 1st Lieut., Miami Beach.
Sol C. Werblow, 1st Lieut., Miami Beach.
Fred E. Whaley, 1st Lieut., St. Petersburg.
Kenneth S. Whitmer, Captain, Miami.

IDAHO

John W. Davis, Captain, Glenns Ferry.

ILLINOIS

Edward M. Baskerville, Captain, Joliet.
Thomas J. Bonick, 1st Lieut., Chicago Heights.
Sheldon S. Brownton, Lieut. Col., Rantoul.
William H. Delicate, Captain, Edwardsville.
Willis G. Diffenbaugh, Captain, Chicago.
Allan Michel Goldman, Captain, Chicago.
Kendall Decatur Gregory, Captain, Decatur.
Stanley R. Grudzien, 1st Lieut., Chicago.
Joseph H. Kaplan, 1st Lieut., Rockford.
Clayton J. Lundy, Major, Chicago.
Foster L. McMillan, Major, Chicago.
Kenneth J. Malmberg, 1st Lieut., Auburn.
Hosmer T. Merrell, 1st Lieut., Chicago.
John E. Miller, Captain, Quincy.
Joseph M. Mitrick, Captain, Chicago.
Milton M. Mosko, Captain, Chicago.
William H. Orcutt, Captain, Chicago.
Harry J. Parker, 1st Lieut., Chicago.
Charles E. Pugh Jr., 1st Lieut., Chicago.
Peter A. Reierson, Captain, Manteno.
Louis P. River, Major, Oak Park.
Frank J. Saletta, 1st Lieut., Chicago.
Albert Frank Stein, Major, Chicago.
Joseph G. Stone, 1st Lieut., Cicero.
Henry S. Swiontek, 1st Lieut., Berwyn.
Max T. Van Orden, 1st Lieut., Chicago.
LeRoy E. Walter, 1st Lieut., Chicago.
Harold H. Was, 1st Lieut., Chicago.
Charles L. Watters, 1st Lieut., Geneseo.
Tom L. Weber, 1st Lieut., Olney.

INDIANA

Henry Fisher, 1st Lieut., Marion.
Arthur F. Hoffman, 1st Lieut., Fort Wayne.
Robert B. Miller, 1st Lieut., Nappanee.
Bernard J. Mulcahy, Captain, Muncie.
David Leslie Smith, Major, Indianapolis.
Russell J. Spivey, Major, Indianapolis.

IOWA

James W. Bookhamer, 1st Lieut., Iowa City.
Bertram H. Dessel, 1st Lieut., Ossian
Dean Harold King, Captain, Spencer.
William T. McElhinney, Captain, Iowa City.
Eugene C. Penn, 1st Lieut., West Des Moines.
Howard H. Smead, Captain, Newton.
Ernest M. Van Patten, 1st Lieut., Fort Dodge.

KANSAS

Clovis W. Bowen, 1st Lieut., Valley Falls.
Donald E. Bux, 1st Lieut., Manhattan.
Arnold F. Nothnagel, Captain, Kansas City.
Edward H. Stratemeier Jr., 1st Lieut., Wichita.
Ronald C. Vetter, 1st Lieut., Lawrence.
Paul B. Young, 1st Lieut., Wichita.

KENTUCKY

David W. Barrow, Major, Lexington.
Forrest Lloyd Blair, 1st Lieut., Louisville.
Chester C. Brummett, 1st Lieut., Middlesboro.
Roy A. Hulse, 1st Lieut., Louisville.
Harmon T. Smiser, Captain, Cynthiana.

LOUISIANA

Edmond Preston Ferguson, Captain, Shreveport.
John H. Pinson Jr., 1st Lieut., Shreveport.
Otis D. Swan, 1st Lieut., New Orleans.

MAINE

Thomas E. Proctor, Captain, Boothbay Harbor.
John E. Smith, 1st Lieut., Bangor.
Charles A. Worthen Jr., 1st Lieut., Bangor.

MARYLAND

James H. Walker, 1st Lieut., Baltimore.

MASSACHUSETTS

Samuel Bachrach, Major, Worcester.
Richard Francis Connolly, 1st Lieut., Danvers.
Edward B. Farren, 1st Lieut., Brockton.
Harold Henry Hamilton, Major, Plymouth.
Edward C. Harrington, 1st Lieut., Holyoke.
Louis S. Lapid, 1st Lieut., Boston.
John J. O'Neill, 1st Lieut., Salem.
Emerson A. Read, 1st Lieut., Quincy.
Max A. Sherman, 1st Lieut., Worcester.
Raoul E. Vezina, Captain, Springfield.

MICHIGAN

Dean Regis Asselin, 1st Lieut., Detroit.
Louis Beresh, Captain, Detroit.
Herbert Milton Blair, 1st Lieut., Sault Ste. Marie.
Wilbur G. Braham, 1st Lieut., Battle Creek.
Charles W. Brooks II, 1st Lieut., Detroit.
Ralph F. Helzerman, 1st Lieut., Tecumseh
John William James, Captain, Saginaw.
Frank D. Johnson, Major, Flint.
George T. Kelleher, Captain, Battle Creek.
Clarence W. Reuter, Major, Bay City.
Robert R. Wright, 1st. Lieut., Detroit.

MINNESOTA

Ralph Theodore Anderson, 1st. Lieut., St. Paul.
Carl L. Eckhardt, 1st Lieut., Austin.
Allen Gray Johnson, Captain, Brainerd.
Peter J. Pankratz, 1st Lieut., Mountain Lake.
Karl W. Pleissner, 1st Lieut. Sauk Center.
Henry J. Reif, 1st Lieut., St. Paul.
Howard A. Shaw, 1st Lieut., Lake Park.
Raphael J. Weisberg, Captain, Excelsior.

MISSISSIPPI

John W. Long, 1st Lieut., Sallis.

MISSOURI

James William Allee, 1st Lieut., Eldon.
George Burton Appleford, 1st Lieut., Lewiston.
Charles Cobene Castles Jr., 1st Lieut., Caruthersville.
David P. Edmundson, 1st Lieut., New Madrid.
Paul F. Fletcher, Major, St. Louis.
John R. Franck Jr., 1st Lieut., St. Louis.
James A. Kinder Jr., 1st Lieut., St. Louis.
Gerald L. Miller, Captain, Kansas City.
Carl A. Schuck, Lieut. Col., St. Louis.
Eamil A. Stricker, Captain, St. James.
Edward L. Taylor, 1st Lieut., Steele.
Paul B. Vatterott, 1st Lieut., Clayton.
Samuel R. Warson, Captain, St. Louis.

MONTANA

Horace H. Koessler, 1st Lieut., Seeley Lake.
Francis W. Paul, 1st Lieut., Bigtimber.

NEBRASKA

Ernest L. Blackmun Jr., 1st Lieut. Omaha.

NEVADA

Irvin Morgenroth, 1st Lieut., Ruth.

NEW HAMPSHIRE

Philippe J. Cote, 1st Lieut., Manchester.

NEW JERSEY

Maurice A. Chodosh, 1st Lieut., Carteret.
William Thomas Richard Cox, Captain, Elizabeth.
Frederick C. DeTroia, Captain, Newark.
David H. Dreizin, Captain, Passaic.
Winslow S. Edgerly, Major, New Rochelle.
Joseph D. Gatti, 1st Lieut., Hackensack.
John H. Harrington, Captain, Rockaway.
Meyer Leonard Kimmel, 1st Lieut., Jersey City.
Montague A. Roberts, Captain, Englewood.
Bertram Hartzell Smith, 1st Lieut., Haddon Heights.
Gordon V. Stoddard, Captain, East Orange.
Martin E. Swiecicki, 1st Lieut., Barrington.
Belford A. Weeks, 1st Lieut., Absecon.

NEW MEXICO

Vincent Marchese, Captain, Tohatchi.

NEW YORK

Hugh Gordon Anderson, 1st Lieut., Troy.
Clarence R. Becker, Captain, Troy.
Michael Stephen Brody, Captain, Brooklyn.
Walter Ambrose Carey, 1st Lieut., Yonkers.
Joseph Thomas Cavaliere, 1st. Lieut., Brooklyn.
Anthony L. Cimildora, Captain, Auburn.
Louis Copulsky, 1st Lieut., Brooklyn.
Edwin Brown Davis Jr., 1st Lieut., New York.
Maxwell David Flank, 1st Lieut., Brooklyn.
Irving Graber, Captain, Brooklyn,
Milton Greenberg, Captain, New York.
Ernest T. Heffer, Captain, Brooklyn
Edward G. Jeruss, Captain, Jamaica.
Joseph Kriegler, Major, Lackawanna.
Gerard C. Maglio, Captain, White Plains.
Roger S. Mitchell, Captain, Glen Falls.
Robert Clinton Page, Major, Mount Vernon.
Herman Selinski, Major, New York.
William F. Sharkey, Captain, Whitestone.
Patrick G. Sickenberger, 1st Lieut., Brooklyn.
Anthony V. Sisca, 1st Lieut., Rye.
Douglas G. Smiley, 1st Lieut., New York.
Wilbur Anderson Smith, Captain, Oaklyn, N. J. (New York).
Arnold F. Snyder, 1st Lieut., New York.
Harry N. Taylor, 1st Lieut., Kenmore.
Louis Teitel, Captain, New York.
Nester John Totero, Captain, New York.
Donald C. Tulloch, Captain, Ogdensburg.
Irving Wecksell, 1st Lieut., New York.
James R. West, 1st Lieut., Rochester.
Daniel A. Wilcox, Captain, Mount Kisco.

NORTH CAROLINA

Alonzo Ray Dawson, Major, Greensboro.
Brockton R. Lyon, Major, Greensboro.

NORTH DAKOTA

Verrill J. Fischer, 1st Lieut., Towner.

OHIO

Frank William Anzinger, 1st Lieut., Springfield.
Joseph John Bell, 1st Lieut., Cincinnati.
Robert J. Doernberg, 1st Lieut., Spencerville.
Deane C. Epler, Captain, Columbus.
Ferdinand V. Geiss, Captain, Cleveland.
Arvine W. Harrold, 1st Lieut., Tiffin.
James R. Hart, 1st Lieut., Cleveland.
Martin M. Horowitz, Captain, Columbus.
Henri A. Kerns, 1st Lieut., Kenton.
Harry Edward King, Captain, Dayton.
Bernard B. Larsen, Major, Cleveland (Shaker Heights).
Henry Luidens, Captain, Cleveland.
Adelbert M. Mills, Captain, Ashtabula.
James F. Mills, 1st Lieut., Cincinnati.
William E. Molle, 1st Lieut., Cincinnati.
Robert E. Odom, Major, Youngstown.
Owen F. Patterson, Captain, Holmesville
Frank J. Pickett, 1st Lieut., Cleveland.
Carl W. Roth, Captain, Columbus.
Leonard G. Steuer, Major, Cleveland.
John M. Wilcox III, 1st Lieut., Cleveland (Lakewood).
Carl E. Zeithaml, Major, Chagrin Falls.
Robert E. Zipf, 1st Lieut., Dayton.

OKLAHOMA

William H. Cantrell, 1st Lieut., Edmond.
Byron J. Cordonnier, Major, Enid.
Isadore Dyer, Captain, Tahlequah.
Claude Williams, 1st Lieut., Anadarko.

OREGON

Earl W. Douglas, 1st Lieut., Portland
Alfred J. French, 1st Lieut., Marshfield.
William Joseph Moore, 1st Lieut., Grants Pass.
George L. Ray, 1st Lieut., Portland.

PENNSYLVANIA

Albert M. Biele, 1st Lieut., Norristown.
James A. Biggins, 1st Lieut., Sharpsville.
Charles K. Brauer, Captain, Philadelphia.
Alfred S. Damiani, 1st Lieut., Philadelphia.
Andrew A. Doering, 1st Lieut., Huntingdon Valley.
Edgar J. Douglas, 1st Lieut., Oakmont.
John M. Hollingsworth, 1st Lieut., Girard.
Henry J. Kohler, Captain, Philadelphia.
Harold B. Lang, 1st Lieut., Fox Chapel.
Leo A. Levine, 1st Lieut., Oil City.
David R. Patrick, 1st Lieut., Monaca.
Ephriam M. Rosset, 1st Lieut., Philadelphia.
Cyrus B. Slease, 1st Lieut., Elderton.
Robert R. Smith, 1st Lieut., Philadelphia.
Nathanael R. Thomas, Captain, Scranton.
Sydney Waldman, 1st Lieut., Philadelphia.
Halsey F. Warner, 1st Lieut., Philadelphia.
Neil K. White, 1st Lieut., Philadelphia.

SOUTH CAROLINA

James W. Harter, Captain, Orangeburg.

TENNESSEE

John Dorritte Evans, Major, Memphis.
James O. Fields, 1st Lieut., Milan.
James E. Goldsberry, Captain, Nashville.
Thomas P. Manigan, Major, Memphis.
Ernest Marcus, Captain, Mountain Home.
Paul W. Wilson, Captain, Dresden.

TEXAS

Frank Joseph Altick, 1st Lieut., Dallas.
Ervin E. Baden, Captain, Raymondville.
George R. Branch Jr., 1st Lieut., Dallas.
Dan Hines Clark, Captain, Crowell.
Jack R. Hild, Captain, Houston.
Jere Becker Johnson, 1st Lieut., Pampa.
Glenn E. Kahler, Captain, Galveston.
Maurice Kaufmann, Captain, Dallas.
Cuvier P. Lipscomb, 1st Lieut., Denison.
Weldon W. Stephen, Captain, Galveston.
Charles W. Yates, Captain, Rosenberg.

VIRGINIA

John E. Fissel Jr., 1st Lieut., Newport News.
Norman Sollod, 1st Lieut., Highland Springs.
Harry J. Warthen Jr., Major, Richmond.

WASHINGTON

Walter Scott Brown, 1st Lieut., Seattle.
Harold C. Hines, 1st Lieut., Toppenish.
John P. McDermott, 1st Lieut., Chehalis.
Leonard G. Morley, 1st Lieut., Tacoma.
Ervin Edson Nichols, 1st Lieut., Port Angeles.
Elmer A. Reiswig, Captain, Seattle.
John W. Wichman, 1st Lieut., Seattle.
Ernest J. Wollenweber, 1st Lieut., Seattle.
Quentin L. Wood, 1st Lieut., Seattle.

WEST VIRGINIA

James Howard Gray, Captain, Clendinin.

WISCONSIN

Edward Anthony Backus, 1st Lieut., Milwaukee.
Robert Moffat Moore, 1st Lieut., Sparta.
Harry Prudowsky, 1st Lieut., Milwaukee.
Phil L. Salkeld, 1st Lieut., Milwaukee.

WYOMING

Nathaniel Olds Williams, 1st Lieut., Cody.

BERMUDA

Bertram H. Seiffer, 1st Lieut., Kings Point.

CANAL ZONE

Peter J. Guokas, 1st Lieut., Balboa.

HAWAII

Francis P. Meyer Jr., 1st Lieut., Pahala.

MISCELLANEOUS

REHABILITATION SERVICES TO THE BLIND AND DEAF

Walter E. Barton, M.D.
Major, Neuropsychiatry Branch, Surgeon General's Office
WASHINGTON, D. C.

Deafness and blindness are deprivations of an essential means of orientation of the normal person. The particular emotional problems of the newly blinded and deafened and their need for assistance in learning how to live without sight and hearing create a need for specialized rehabilitation.

It has been established that it is essential to make an early contact with the handicapped soldier by trained personnel who can encourage him and help him to look forward hopefully to the future. Oftentimes the onset of blindness or deafness is coincident with convalescence from severe medical illness or complicating wounds which will confine a patient in the hospital for a long period of time. Early treatment which restores some of the patient's confidence and optimism will do much to shorten the rehabilitation period. It is the intention of the Medical Department to make available during the period of Army hospitalization a rehabilitation service to all who lose their eyesight or their hearing, either here or abroad. The Army does not intend to take over the entire rehabilitation program; that is the province of the Veterans Administration for pensionable disabilities or, in cases not eligible for veterans' benefits, of the state vocational rehabilitation services.

The Surgeon General of the Army has designated certain Army hospitals for the care of the blind and the deaf. Valley Forge General Hospital in Phoenixville, Pa., and the Letterman General Hospital, San Francisco, have been designated for the care of the blind. Walter Reed General Hospital, Washington, D. C., Hoff General Hospital, Santa Barbara, Calif., and the Borden General Hospital, Chickasha, Okla., have been designated for the care of the deaf.

Well qualified specialists in diseases of the eye and ear and related specialties have been assigned to the designated special hospitals. In hospitals for the blind, teachers instruct the patient in self care, social adjustment, the use of the talking book, braille reading and writing, the use of braille watches and other technics used by the blind to compensate for the loss of sight. Occupational therapists teach motor coordination to the blind and the principles of work activity without the aid of sight.

In the hospitals for the deaf, lip reading teachers and speech teachers instruct the person how to read lips and to carry on normal social relationships without the aid of hearing. Many of the hard of hearing are helped by hearing aids.

The American Red Cross social worker assists in the transition between the hospital and the home and prepares the family for the reception of the handicapped person. An emotionally upset and overly sympathetic family may, through its pity, destroy much of the self confidence and self reliance that the patient will learn unless it is prepared to meet the situation wisely.

It is to be hoped that, if instead of dreary endless days of self pity during convalescence in Army hospitals there are substituted full and busy days of retraining and hopeful anticipation of an interesting future, many soldiers will overcome the handicap of blindness and deafness.

REGISTRANTS WITH POSITIVE SEROLOGIC REACTIONS

The U. S. Public Health Service, working with state and local health officers, will present to each local board of the Selective Service System, through its state director of Selective Service, a form (VM 1220) containing the initials of registrants who have been found to have a positive serologic reaction. The local board will fill in certain data on this form and return it through the state director of Selective Service to the local health officer indicated thereon. In due time after the form has been delivered to the local health officer the local board will receive through its state director of Selective Service

another U. S. Public Health Service form (VM 1222) which again lists the order numbers and initials of registrants having a positive serologic reaction and indicates opposite the order new pertinent data with reference to treatment received by the registrant or his physical fitness for service. The director of the Selective Service System, Lewis B. Hershey, in Local Board Memorandum No. 184, issued on July 8, calls special attention to certain columns in form VM 1222 which should be acted on by the local board: (1) needs treatment, (2) now available, (3) probably never available. Director Hershey in this memorandum sets forth the procedure to be used in cooperating with the Public Health Service in making a checkup on registrants with a positive serologic reaction.

HOW HOSPITALS CAN EASE THE NURSING SHORTAGE

According to the American Red Cross, Army nurses are now on duty in 537 stations in the United States and in 28 countries outside the United States: Africa, Alaska, Aruba, Australia, Bermuda, Canada, Egypt, England, the Fiji Islands, Greenland, Hawaii, Iceland, India, Iran, Ireland, Jamaica, Newfoundland, New Caledonia, New Guinea, New Zealand, Pantelleria, Palestine, Panama, Puerto Rico, Philippine Islands, South America (Brazil), Sicily, Trinidad.

Navy nurses are on duty in 212 stations in the United States, including all naval air stations in the interior. They are assigned also to 27 countries outside the continental United States, including Alaska, Hawaii, Puerto Rico, Cuba, the Panama Canal Zone, Australia, Trinidad, the Virgin Islands and many of the islands of the South Pacific. They are at work on the two navy hospital ships *Solace* and *Relief* and will go on duty on the two new hospital ships after they are commissioned.

Nurses of the Army and Navy are flying to distant outposts to bring back wounded soldiers to general hospitals to the rear of the battle fronts or in this country; they are serving on troop transports which fly through enemy infested waters in every part of the globe; they are working in tent hospitals so close to the fighting that a helmet is an essential part of their uniform; they are helping pick up the wounded in the South Pacific who without their ministrations on hospital ships might have died. Courageous and devoted to duty, they are hailed as "good soldiers" in hundreds of hospitals in this global war.

Definite ways in which hospitals can make adjustments so as to ease the nursing shortage and make it possible for more nurses to be released for military duty without endangering life and health of their patients are:

1. Increased use of Red Cross Volunteer Nurse's Aides.

2. Increased use of part time graduate nurses who are not able to give full time; this will mean adjustment to time honored schedules so as to suit the convenience of married women with home responsibilities.

3. Use of special nurses for critically ill patients only.

4. Increased use of group nursing so as to allow one special nurse to care for 2 or more patients.

5. Elimination of all luxury nursing, regardless of the financial status of the patient.

6. Careful study of nursing practice, so as to limit nurses to the carrying on of professional duties only, thus turning over more duties to nonprofessional aides.

7. Careful screening of surgical operations so as to include only urgent cases.

8. Better understanding on the part of hospital management, including board members, that it is their patriotic duty to allow nurses to join the Army or Navy and to put no obstacle in their path.

9. Adherence to regulations about visiting hours.

10. Prescribing of certain hours for the delivery of flowers for patients.

ANNUAL MEETING OF ASSOCIATION OF MILITARY SURGEONS

The fifty-first annual meeting of the Association of Military Surgeons of the United States will be held at the Bellevue-Stratford Hotel, Philadelphia, October 21-23, under the presidency of Rear Admiral William L. Mann (MC), U. S. Navy. The program will comprise lectures by officers on active duty, some of whom recently returned from the battle fronts, a practically continuous schedule of motion pictures, scientific and technical exhibits, teaching panels, and entertainment.

Hon. Edward Martin, governor of Pennsylvania, Bernard Samuel, mayor of Philadelphia, and Dr. Eugene Pendergrass, president of the Philadelphia County Medical Association, will give addresses of welcome. Major Gen. Norman T. Kirk, Surgeon General, U. S. Army, Rear Admiral Ross T. McIntire, Surgeon General, U. S. Navy, and Dr. Thomas Parran, Surgeon General, U. S. Public Health Service, will speak. General Kirk will preside at Army Night on Thursday, on which occasion President Roosevelt will greet the assembly by radio and the Chinese ambassador, Dr. Wei Tao-Ming, will give a nationwide radio address. At Navy Night on Friday Rear Admiral McIntire will preside and the Secretary of the Navy, Hon. Frank Knox, will give an address (THE JOURNAL, June 12, p. 446).

WARTIME GRADUATE MEDICAL MEETINGS

A number of tentative programs of Wartime Graduate Medical Meetings have been previously listed in THE JOURNAL (June 5, p. 382; July 3, p. 683). Two additional tentative programs have now been prepared.

Dr. Frederick A. Coller is national consultant for the six hour schedule on the subject of trauma to the abdomen. This is to include discussions of the pertinent anatomy and physiology, classification of abdominal wounds, treatment of wounds and postoperative treatment including the management of complications.

Urology, with Dr. Herman L. Kretschmer, President-Elect of the American Medical Association, as national consultant, has a tentative program involving four days, each with a six hour teaching schedule. The first day is to include injuries of the genitourinary tract and inflammatory lesions of the genitourinary tract. The second day is to be devoted to the bladder, including stones and tumors. On the third day disorders of the prostate, urethra, scrotum, epididymis and penis are to be discussed. The final six hour teaching schedule, on the fourth day, is to be devoted to the acute retention of urine, the technic of catheterization, anuria, and spinal cord bladder following cerebrospinal injuries.

BRAZILIAN OFFICERS OBSERVE METHODS AT FIELD SERVICE SCHOOL

Two Brazilian army medical officers are students in the 34th Officers Training Battalion at Carlisle Barracks, Pennsylvania, observing the methods taught at the Medical Field Service School. They are members of a group of Brazilian officers who are noting army methods in various camps of this country. After this six weeks course is completed they expect to tour another army camp before returning to Brazil.

Capt. Alvaro Menezes Paes graduated from the University of Rio de Janeiro in 1929, then entering private practice until 1935. Capt. Americo Doyle Ferreira also attended the University of Rio de Janeiro, where he received his M.D. degree and engaged in private practice in Recife for a year. Both officers served internships in Rio de Janeiro hospitals.

ARMY-NAVY E

The employees of the W. A. Baum Company, New York, makers of blood pressure apparatus, were awarded the Army-Navy E for achievement in producing necessary war equipment at a ceremony in New York on August 20. Lieut. Col. R. R. Patch of the Sanitary Corps of the Army presented the flag to Mr. W. A. Baum, president of the company, and Capt. Ernest R. Eaton (MC), U.S.N.R., presented the E pins to the oldest employee of the company, Mr. H. C. Rasmussen.

ORGANIZATION SECTION

OFFICIAL NOTES

MEDICAL MOTION PICTURES

Medical motion pictures are available on a loan basis from the American Medical Association to medical societies, medical schools, hospitals and other scientific groups. Requests should be instituted as far in advance as possible, so that the proper reservations can be made. The exact shipping addresses and dates should be given at the time of the request; also the type of apparatus in which the film is to be run. Responsibility for the projection and care of the film must be borne by the individual or organization which is borrowing it. The American Medical Association does not have projectors available for loan.

The only expense incurred is that of transportation both ways. However, careless handling resulting in serious damage may be charged to the borrower.

Requests should be sent to the Director, Scientific Exhibit, American Medical Association, 535 North Dearborn Street, Chicago 10.

ANESTHESIA

Dynamics of Respiration

Silent. Colored, 16 mm., 2 reels, 400 feet each.
Running time about 25 minutes.
Dynamics of respiration showing normal respiration, respiration in various stages of anesthesia and in different pathologic conditions.
Prepared by the Departments of Anesthesia, Radiology and Photography, University of Wisconsin Medical School, Madison, for the Special Exhibit on Anesthesia of the American Medical Association.

Regional Anesthesia for Operations on the Neck

Silent. 16 mm., 1 reel, 400 feet.
Running time about 16 minutes.
Film shows detail of technic of anesthesia for operations on the neck.
Prepared by Dr. Ralph M. Tovell, Section on Anesthesia, the Mayo Clinic, Rochester, Minn., for the Special Exhibit on Anesthesia of the American Medical Association.

Signs of Inhalation Anesthesia

Silent. 16 mm., 2 reels, 300 feet each.
Running time about 25 minutes.
Details of signs of inhalation anesthesia with charts presented by Dr. Arthur E. Guedel, Los Angeles.
Prepared by Dr. Henry S. Ruth and Dr. J. Harvey Sigafoos, Department of Anesthesia, Hahnemann Hospital, Philadelphia, for the Special Exhibit on Anesthesia of the American Medical Association.

Technic of Blocking Sacral Nerve

Silent. 16 mm., 1 reel, 400 feet.
Running time about 15 minutes.
Film shows details of technic for blocking sacral nerve.
Prepared by the Section on Anesthesia, the Mayo Clinic, Rochester, Minn., for the Special Exhibit on Anesthesia of the American Medical Association.

The Technic of Carbon Dioxide Absorption in Anesthetic Atmospheres

Silent. 16 mm., 2 reels, 400 feet each.
Running time about 30 minutes.
Details of technic for absorbing carbon dioxide in anesthetic atmospheres.
Prepared by Departments of Anesthesia and Photography, University of Wisconsin Medical School, Madison, for the Special Exhibit on Anesthesia of the American Medical Association.

The Role of Carbon Dioxide in Convulsions During Anesthesia

Silent. 16 mm., 1 reel, about 200 feet.
Running time about 7 minutes.
The picture shows convulsions during anesthesia and their control.
Prepared by Departments of Anesthesia, Radiology and Photography, University of Wisconsin Medical School, Madison.

PHYSICAL THERAPY

Aids in Muscle Training

Silent. 16 mm., 1 reel, 300 feet.
Running time about 12 minutes.
Demonstration of sling suspension exercises for the upper and lower extremities, graded exercises on a powdered board for the lower extremities and three kinds of "walkers" for reeducation exercises.
Prepared by the Council on Physical Therapy, American Medical Association, 535 North Dearborn Street, Chicago.

Contraction of Arteries and Arteriovenous Anastomoses

Silent. 16 mm., 1 reel, 250 feet.
Running time 10 minutes.
This film visualizes the contraction of arteries and arteriovenous anastomoses as seen through a glass chamber installed in a rabbit's ear.
Prepared by Dr. E. R. Clark, University of Pennsylvania School of Medicine, Philadelphia.

Effects of Heat and Cold on the Circulation of the Blood

Silent. 16 mm., 1 reel, 300 feet.
Running time 12 minutes.
Demonstration of the effect of heat and cold on circulation as seen through a glass chamber installed in a rabbit's ear.
Prepared by Dr. E. R. Clark, University of Pennsylvania School of Medicine, Philadelphia.

Effects of Massage on the Circulation of the Blood

Silent. 16 mm., 1 reel, 200 feet.
Running time 8 minutes.
Demonstration of the effect of massage on circulation as seen through a glass chamber installed in a rabbit's ear.
Prepared by Dr. E. R. Clark, University of Pennsylvania School of Medicine, Philadelphia.

Massage

Silent. 16 mm., 1 reel, 100 feet.
Running time 4 minutes.
Demonstration of technic of massage, describing the various movements and why they are performed in a given way.
Prepared by the Council on Physical Therapy, American Medical Association, 535 North Dearborn Street, Chicago.

Occupational Therapy

Silent. 16 mm., 1 reel, 300 feet.
Running time 12 minutes.
This film demonstrates occupations that may be prescribed by physicians to motivate and control the desired physical or mental activity of the patient and assist in his adjustment to long hospitalization. A section on cerebral palsy is included, picturing indirect muscle training through prescribed activity and stressing the importance of early treatment to prevent growth of faulty habit patterns.
Prepared by the Council on Physical Therapy, American Medical Association, 535 North Dearborn Street, Chicago.

Underwater Therapy

Silent. 16 mm., 1 reel, 400 feet.
Running time about 16 minutes.
Presentation of therapeutic use of large and small exercise pools, Hubbard tanks and home made tanks, and demonstration of types of exercises given in cases such as infantile paralysis, cerebral palsy and postoperative congenital dislocation of the hip.
Prepared by the Council on Physical Therapy, American Medical Association, 535 North Dearborn Street, Chicago.

SYPHILIS

Syphilis—A Motion Picture Clinic (1937)

Sound. 16 mm., 4 reels.
The four parts may be scheduled separately for successive meetings, or all shown at one meeting. The picture provides a complete summary of the present day knowledge of syphilis in all its forms.
Part 1. Diagnosis of Early Syphilis, by Dr. John H. Stokes, 15 minutes.
Part 2. Treatment of Syphilis, by Dr. Harold N. Cole, 17 minutes.
Part 3. Latent and Late Syphilis, by Dr. Paul A. O'Leary and Dr. Joseph Earle Moore, 21 minutes.
Part 4. Syphilis in Pregnancy and Congenital Syphilis, by Dr. James R. McCord and Dr. Philip C. Jeans, 15 minutes.
Sponsored jointly by the American Medical Association and the United States Public Health Service.
Produced by Burton Holmes Films, Inc., 7510 North Ashland Avenue, Chicago.

Syphilis—A Teaching Film (1942)

Sound. 16 mm., 3 reels.
The three parts can be scheduled separately for successive meetings. The picture is an effective presentation of the essentials of the diagnosis and treatment of syphilis from the professional point of view.
Part A. Diagnosis of Early Syphilis, 18 minutes.

Part B. Diagnosis of Latent Syphilis, 14 minutes.
Part C. Management of Syphilis, 29 minutes.
Prepared by United States Public Health Service.

OTHER SUBJECTS

Blood Transfusion

Silent. 16 mm., 1 large reel, 1,200 feet.
Running time about 45 minutes.
Three methods of blood transfusion illustrated in detail.
Sponsored by the Blood Transfusion Betterment Association, 39 East 78th Street, New York.
Produced by Mr. Joseph P. Hackel, New York.

Comparative Physiology of Labor

Silent. 16 mm., 4 reels, total about 1,400 feet.
Running time about one hour.
Demonstration of normal labor in the human being, the horse, the cow, the sheep, the dog, the pig and the rabbit.
Produced by Prof. K. de Snoo, Obstetric and Veterinary Clinics, University of Utrecht, Netherlands.

The Hygiene of Swimming

Silent. 16 mm., 1 reel, 400 feet.
Running time 15 minutes.
This picture shows that man is not adapted to aquatic life and illustrates the danger of infection to the ear, nose and throat, the danger of diving in shallow water and the danger of chilling from cold water.
Prepared by Dr. H. Marshall Taylor, Jacksonville, Fla., for the Section on Laryngology, Otology and Rhinology of the American Medical Association.

Medical History in Clinical Teaching

Silent. 16 mm., 2 reels, about 300 feet each.
Running time about 25 minutes.
History of physical diagnosis with scenes from the lives of Hippocrates, William Harvey, Rev. Stephen Hales, Leopold Auenbrugger von Auenfrug, René Théophile, Hyacinthe Laënnec and Wilhelm Konrad Roentgen.
Prepared by Department of Cardiology, Woman's Medical College of Pennsylvania, Philadelphia.

MEDICAL ECONOMIC ABSTRACTS

DELAWARE MEDICAL CARE PLAN

The Newcastle County Medical Society of Delaware, after a study of various prepayment plans throughout the country, submitted a report outlining a plan to inaugurate a voluntary limited health insurance program. The report was accepted and the plan has now been in operation for about three months. A report of progress by Harold V. Maybee is given in the July issue of the *Delaware State Medical Journal.*

The plan is to cover surgical care only, at least in the beginning. It is operated by the board of trustees of the Group Hospital Service, Inc. Individuals who are also members of the hospitalization plan pay 60 cents a month for the surgical coverage; a family pays $1.65. At the present time approximately 6,500 are covered by the medical care plan.

The plan operates on the indemnity principle. The physician is to charge the patient the same fee which he would have charged if the patient had not been a member of the Group Hospital Medical Plan. The difference between the total fee charged by the physician and the amount payable under the schedule of indemnification is to be collected by the physician directly from the patient. Participating physicians receive 100 per cent of the schedule of indemnification and nonparticipating physicians receive 50 per cent.

HOSPITAL TO BE OPERATED BY PREPAYMENT PLAN

The King County (Seattle) Medical Service Corporation has met a hospital emergency by undertaking to cooperate in the construction and operation of a hospital financed largely by the Federal Works Agency.[1] The agency first offered a grant of $600,000 to construct a wing to the King County Hospital on condition that the county commissioners provide an additional $200,000. A referendum at the fall election failed to receive the two-thirds majority required for the county expenditures. King County Medical Service Bureau then proposed that the FWA make the grant to the bureau for the purpose of providing for hospital needs.

The King County Medical Service Bureau, organized for the purpose of providing medical service on a monthly prepaid basis for low wage earners, is composed of 480 physicians included in the 665 members of the King County Medical Society. The bureau is operated by the corporate body, the King County Medical Service Corporation, composed of ten members elected by the bureau. Negotiations with the federal officials were conducted by this corporation. The Federal Works Agency made a thorough examination of the bureau and its corporation and became satisfied with its ability to meet requirements for hospital construction.

The Medical Service Bureau has been operated during the past ten years. Its subscribers number about 75,000 employees. It has a daily average of about 80 hospital patients. In addition to caring for this class of patients the hospital will be available for reception of patients of all members of King County Medical Society. It will be operated on a nonprofit basis; any surplus will be devoted to the welfare of its patients.

A 200 bed hospital will be constructed, furnished and equipped, the FWA granting $600,000 and the Medical Service Corporation supplying the additional $200,000. The exclusive ownership and operation of the hospital will be vested in the Medical Service Corporation. Dr. K. H. Van Norman, who has served as superintendent for the King County Hospital for the past eleven years, will also serve as manager of the new hospital.

1. Northwest Med. **42**: 179 (July) 1943.

MEDICAL SERVICE PLANS IN NEW YORK CITY

To secure unity in the handling of medical problems in greater New York an economic council has been formed consisting of the chairman and two members of each of the economic committees of the five county medical societies within greater New York. Dr. William Bryant Rawls, chairman, outlines the work of this committee.[1] "Some of the more important subjects studied" he says "were (1) the care of the medically indigent, (2) existing voluntary health insurance plans, (3) changing present hospital rules so that physicians may be paid for their services from those ward patients who have medical insurance, and (4) increasing the present compensation rates."

The study of the various voluntary health insurance plans showed that these have not made the expected progress. Out of several plans launched only three were functioning, and these had issued far fewer policies than had been expected. The committee recommended an amalgamation into one plan with a single selling organization. Meetings have been held with all the plans and with the Associated Hospital Service and there are good prospects of a unified plan for greater New York.

The committee has also endeavored to find a means whereby physicians can collect for their services from the ward patients who have medical insurance. Several such patients have entered ward service of the voluntary hospitals and less frequently of the city hospitals. Many of these hospitals have rules that prevent physicians from collecting fees from ward patients even though they have insurance covering medical service. A committee consisting of members of the five county medical societies has been appointed to consult with representatives of the various hospital groups to discuss the possibility of permitting physicians to collect a fee in such cases.

1. J. M. Soc. County of New York **2**: 5 (July 31) 1943.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST: SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION AND PUBLIC HEALTH.)

COLORADO

New Director of Laboratories.—William H. Gaub, C.P.H., U. S. Public Health Service, has been lent to the Colorado State Board of Health to serve as director of the division of laboratories, following the resignation of Dr. Frances M. McConnell-Mills, Denver.

Plague in Rodents in Eastern Colorado.—On July 5 fleas obtained from black tailed prairie dogs (Cynomys ludovicianus) secured in Larimer County 5 miles northwest of Wellington were proved by animal and microscopic examination to be infected with plague. This is said to be the first indication of plague infection in eastern Colorado. According to the state board of health, this is the second instance in which plague has been found in Colorado fleas obtained from rodents, the other instance being on the western slope. The state board reports no cases of plague in human beings have thus far been recorded in Colorado.

GEORGIA

Personal.—Dr. James F. Hackney has been made director of the health department of Atlanta.——J. Allen Scott, associate director of the division of malaria and hookworm service, Georgia Department of Public Health, has resigned to become senior statistician of the division of vital statistics of the U. S. Bureau of Census, Washington, D. C.——Dr. Jacob D. Farris, formerly college physician at Eastern Kentucky State Teachers College, Richmond, now occupies a similar position at Emory University, Atlanta.

Municipal Quarantine Hospital for Venereal Diseases.—Federal funds totaling $250,000 have been allocated to Georgia to finance a new municipal quarantine hospital in Augusta, which is expected to be the first community hospital for the treatment of venereal diseases in the nation. Other quarantine hospitals draw their patients from the entire state, according to the Augusta *Herald*. Augusta and Richmond County will contribute about $25,000 to the project. Vocational help will be given to patients while they are receiving treatment for syphilis and gonorrhea. The patients will also be given about $30 a month so that they will have a fund when a cure has been effected, obviating the need to return to vice for a living. The project will take over the NYA buildings at Lake Olmsted, including dormitories, mess hall, recreation rooms and work shops. Forest C. Hunter, P. A. Surg., U. S. P. H. S. (R), has been named in charge of the hospital, which was to receive its first patients August 4.

ILLINOIS

License Revoked.—The Illinois State Board of Registration in Medicine on June 22 revoked the license to practice medicine of Dr. Delbert R. Blender, Chicago. Dr. Blender was found to be guilty of fraudulent and feloniously carrying on the business of dealing in, dispensing and distributing opium and its derivatives without having paid the special tax imposed and without having registered with the collector of internal revenue. The Michigan license of Dr. Blender had been revoked on June 8.

Chicago

City Receives Plaque for Noise Abatement Work.—To mark Chicago as winner of the 1943 Achievement Awards of the National Noise Abatement Council, the presentation of a plaque to Mayor Kelly will take place at a special ceremony on September 15. The selection of Chicago as the winner in cities with a population over 500,000 is attributed to the work of the Noise Reduction Council of Greater Chicago, of which Mayor Kelly is honorary chairman and Mr. Fred M. Echoff is president. Memphis was winner in the group of cities with from 250,000 to 500,000, Salt Lake City 100,000 to 250,000, and Charleston, W. Va., less than 100,000. The awards are given in recognition of outstanding civic accomplishment in the abatement of unnecessary noise and in the observance of national noise abatement week. In Chicago special emphasis was placed on manpower conservation and programs to aid war production. To consolidate this interest in the health of war workers a special Noise Abatement Commission was created by Mayor Kelly on June 23 with Mr. Echoff as chairman. Other members of the commission include Dr. Herman N. Bundesen, Britton I. Budd, Paul Drymalski, Karl Eitel, Alderman Joseph S. Gillespie, Alderman William H. Harvey, Patrick H. Joyce, Alderman George D. Kells, Oscar G. Mayer, Alderman Bertram B. Moss, Alderman Robert C. Quirk, Thomas L. Slater and Philip K. Wrigley. Offices of the new commission are at 134 North LaSalle Street, room 1506. Mr. Philip S. English is operating manager. Mr. R. Allen Wilson is secretary of the Noise Reduction Council, which was organized in 1941. The two groups will function independently.

INDIANA

Physician Observes Ninety-Ninth Birthday.—On August 16 Dr. Henry C. Rogers, Rockville, Civil War veteran, observed his ninety-ninth birthday. Dr. Rogers received his degree at the Indiana Medical College, Indianapolis, in 1876.

KANSAS

Physician Acts as College President and Practicing Physician.—Dr. Orville S. Walters is president of Central College, McPherson, serving in this capacity on week ends, newspapers reported August 4. During the week he serves as house physician at Wesley Hospital, Wichita.

Attorney General Renders Opinion on Hospitals and Narcotics.—Applications for registration of hospitals in Kansas may be approved, provided the application is executed by a duly qualified physician, who will have complete control of and assume responsibility for all narcotic drugs in the hospital, according to the Bureau of Narcotics in Washington after an opinion had been handed down by A. B. Mitchell, attorney general of Kansas. The bureau of narcotics points out that applications executed by osteopaths should not be approved, as osteopaths in Kansas are not entitled to dispense narcotic drugs.

KENTUCKY

Memorial to the Late Dr. Turner.—A public memorial meeting was given by the staff of the T. J. Samson Community Hospital, Glasgow, on July 20 in honor of the late Dr. Caswell C. Turner, who, at the time of his death on February 28, was president-elect of the Kentucky State Medical Association.

Dr. Blackerby Named State Health Officer.—Dr. Philip E. Blackerby, Louisville, assistant commissioner of the state department of health, has been appointed state health commissioner to complete the unexpired term of the late Dr. Arthur T. McCormack. Dr. Blackerby will serve until the next regular election in 1946.

Changes in Health Officers.—Dr. Agnes L. Brown, Hardinsburg, has been named health officer of Muhlenberg County.——Dr. James O. Nall, Marion, has resigned as district health officer of Crittenden, Lyon and Caldwell counties to devote his time to private practice.——Dr. William G. Morgan, Owensboro, recently resigned as director of the Daviess County Health Department, to accept a similar position in Montgomery County.——Dr. Chester R. Markwood, Glasgow, has resigned as health officer of Allen, Barren and Monroe counties to engage in private practice at Cave City.

MASSACHUSETTS

New Chairman of Medical Board.—Dr. Edward A. Knowlton, Holyoke, was recently elected chairman of the state board of registration in medicine. Dr. Knowlton is now serving his third term as a member of the board. The late Dr. Francis R. Mahony was chairman of the board at the time of his death.

Dr. Cannon Honored.—Dr. Walter B. Cannon, Cambridge, president of the recently formed American-Soviet Medical Society, was formally inducted as a member of the Academy of Sciences of the Union of Soviet Socialist Republics at a reception given in his honor by the Soviet embassy on August 12. Dr. Cannon, who is professor emeritus of physiology at Harvard Medical School, is the first American to be a member of both the Academy of Sciences of the United States and that of the Soviet Union, according to the release announcing the honor. The American-Soviet Medical Society was recently organized to stimulate the exchange of medical information between this country and the Soviet Union.

Dr. Clarke Appointed Clinical Professor at Harvard.—Dr. Charles Walter Clarke, executive director of the American Social Hygiene Association, New York, has been appointed clinical professor of public health practice at Harvard University. For the past three years Dr. Clarke has served as a lecturer in the Harvard School of Public Health, Boston, on public health administration practice as applied to the control

of syphilis and gonorrhea, giving ten lectures on the subject each year. In the new appointment Dr. Clarke, in addition to teaching, will supervise the field training of the students of public health specializing in venereal disease control. He will continue as executive director of the social hygiene association.

MICHIGAN

State Medical Meeting.—The Michigan State Medical Society will hold its seventy-eighth annual session in Detroit at the Statler Hotel, September 22-24, under the presidency of Dr. Howard H. Cummings, Ann Arbor. Out of state speakers will include:

Dr. James E. Paullin, Atlanta, Ga., The Responsibility of the Medical Profession in Postwar Planning.
Dr. Frank H. Lahey, Boston, Biliary Tract Disease.
Dr. Oliver S. Ormsby, Chicago, Avitaminosis in Dermatology and the Value and Limitations of the Sulfa Group in Skin Diseases.
Dr. Edward L. Jenkinson, Chicago, Deformities of the Pyloric Antrum Due to Perigastric Adhesions and Bands Simulating Intrinsic Gastric Lesions.
Dr. Paul R. Cannon, Chicago, Protein Metabolism and Resistance to Infection.
Dr. Edward A. Schumann, Philadelphia, Postpartum Sterilization an Indefensible Procedure.
Dr. Irvine McQuarrie, Minneapolis, Causes and Treatment of Edema in Childhood.
Dr. Kellogg Speed, Chicago, Treatment of Open Fractures.
Dr. Harold I. Lillie, Rochester, Minn., Certain Observations on Headaches of Intranasal Origin.
Dr. Everett D. Plass, Iowa City, Wartime Obstetrics.
Col. Leonard G. Rowntree, M. C., A. U. S., Washington, D. C., subject to be announced.
Dr. A. Ashley Weech, Cincinnati, The Challenge of Postwar Pediatrics.
Dr. John C. Whitehorn, Baltimore, Methods of Personality Study in Relation to Medical Problems.
Dr. Hobart A. Reimann, Philadelphia, The Viral Pneumonias.
Dr. William S. Sadler, Chicago, Psychiatric Aspects of the Warring Nations.
Dr. Peter C. Kronfeld, Chicago, Preventable Blindness.
Dr. Harry R. Foerster, Milwaukee, Dermatitis of War Industries in General Practice.
Dr. Walter C. Alvarez, Rochester, Minn., Small Unrecognized Strokes, a Common Cause of Illness in Older Persons.
Drs. Robert D. Mussey, Rochester, and Thomas R. Wilson, co-author, Abnormal Uterine Bleeding Past Middle Age and Its Management.

Wednesday, September 22, designated President's Night, will be a public meeting at which Dr. Schumann, Philadelphia, will present the Andrew P. Biddle Oration on "Medical Education and Present Day Philosophies of Government." On September 24 a special meeting will be held for the public at which Sister Elizabeth Kenny, Minneapolis, will speak. In the afternoon Sister Kenny will discuss "Poliomyelitis: Contrast Between the Kenny and Orthodox Concepts, with Results of Treatment." The program will also include sixteen discussion conferences on the specialties. The woman's auxiliary will meet September 20-22.

MINNESOTA

Grants to the University.—The University of Minnesota Medical School, Minneapolis, announces a new annual appropriation by the state legislature of $15,000 to the medical school for special research in the field of cancer. Announcement is also made of the continuation of the grant of $10,000 a year by the Citizens Aid Society to the medical school in support of cancer research and the program of cancer education and a continuation of the annual gift of $5,500 by the society to support the George Chase Christian professorship in cancer research. A grant of $5,000 from the Jane Coffin Childs Memorial Fund for medical research has been made for the support of the work of John J. Bittner, Ph.D., and Dr. Robert G. Green and his associates in the departments of physiology and bacteriology on the nature and mode of action of the milk influence in mammary cancer. A grant of $3,500 a year for a two year period has been made by the Commonwealth Fund of New York toward the support of the Psychiatric Clinic for Children. Toward the support of this clinic the Stevens Avenue Home of Minneapolis will continue its grant of $10,000 for the year beginning July 1, 1943. The medical school has accepted a grant of $3,000 from Parke, Davis & Company to establish a fellowship in clinical hematology in the department of anatomy under the supervision of Hal Downey, Ph.D.

NEW YORK

Lecture on Traumatic Surgery.—"Traumatic Surgery with Emphasis on the Treatment of Wounds and Shock" was the title of a lecture by Dr. Walter D. Ludlum Jr., New York, given before the Medical Society of the County of Greene in Catskill, August 27. The lecture was sponsored by the state medical society and the state department of health.

Salary Changes for Mental Hygiene Employees.—On October 1 a plan will be made effective in salaries of all mental hygiene employees under provisions of the salary standardization law. Classification of positions for 21,000 employees of the state department of mental hygiene providing salary increases for many will go far toward providing administration of mental hospitals, the New York *Times* reported, August 19. In a statement to the press Dr. Frederick MacCurdy, state commissioner of mental hygiene, said that "careful attention was given to gradation of positions so as to augment the possibility of promotion from grade to grade and to make as many career positions as possible in hospitals."

New York City

Changes at New York College of Medicine.—Dr. James Leroy Wilson, formerly of Detroit, has been appointed professor of pediatrics and chairman of the department at New York University College of Medicine. New appointments include the following: departments of anatomy and psychiatry, Dr. Margaret A. Kennard, New Haven, Conn., assistant professor of anatomy and assistant professor of neuropsychiatry; department of dermatology and syphilology, Drs. Arthur Edward Goldfarb and John Cooper Graham, Brooklyn, assistant clinical professor; department of ophthalmology, Drs. Richard Townley Paton and David Henry Webster, clinical professors; department of psychiatry, Dr. David J. Impastato, assistant clinical professor. Dr. Bernhard Dattner has been promoted to associate clinical professor of neurology; Dr. Frank C. Keil, clinical professor of ophthalmology; Dr. Walter Guernsey Frey Jr., clinical professor of ophthalmology, and Dr. Ervin A. Tusak, clinical professor of ophthalmology.

Physicians Barred in Compensation Cases.—Two physicians whose workmen compensation practices were said to be among the largest in the city lost their licenses to do that work on August 11 by order of the state labor department because of fee splitting and other misconduct, the New York *Times* reports. They are Drs. Emanuel A. Schiffmann and Leo S. Sacharoff. Two other physicians, guilty of similar charges but in lesser degree, had their licenses suspended for six months and three months respectively: Robert H. Feldman and William Philip Smale. The *Times* stated that 1,200 physicians are under or scheduled for investigation as a result of disclosures concerning "kickbacks" by the recent Moreland Act inquiry into workmen's compensation abuses. The recent 4 cases are the first decisions to be made after departmental trials. Previously Dr. Theodore R. Freedman, Brooklyn, lost his license without formal hearing when he sent a resignation instead of appearing when summoned (THE JOURNAL, July 10, p. 757).

Illegal Practitioner Sentenced to Workhouse.—The state education department announces that Frederick Charles Quitzreau pleaded guilty, June 2, to holding himself out unlawfully as a practitioner of medicine and was sentenced on June 16 in the City Court of Special Sessions to serve six months in the workhouse. Quitzreau is said to have a long record of illegal representation. Although he claimed graduation at the Friedrich-Wilhelms-Universität Medizinische Fakultät, Berlin, Prussia, in 1908, a letter from the school states that a Mr. Charles Quitzreau "neither studied at this university nor did he receive a degree." Before his credentials in Germany were investigated, he was admitted to the medical examinations in Saskatchewan, Canada, Illinois and Maine but failed in all of them, but he is reported to have practiced medicine in these places. In 1922 it was stated that he had been convicted while a member of the Anna (Ill.) State Hospital on a charge of practicing medicine without a license and was fined $100 and costs. Quitzreau is reported to have been a resident physician in Philadelphia and in Verona, N. J. He was said to represent himself as a physician in Potsdam, N. Y., although one report stated that "he is doing nothing in the way of work." He has applied for staff positions at hospitals and sanatoriums in different sections of the country.

NORTH DAKOTA

Observes Ninety-Third Birthday.—Dr. James Grassick, Grand Forks, observed his ninety-third birthday on June 30. Dr. Grassick, who received degrees at Rush Medical College in 1885 and at the University of Michigan Department of Medicine and Surgery, Ann Arbor, in 1888, started practice in Buxton in 1885.

OHIO

Yellow Fever Volunteer Dies.—Lieut. Col. Thomas M. England, for twenty-four years executive officer of the Fifth Service Command Medical Branch, Fort Hayes, Columbus, died on July 23, aged 67. Colonel England was exposed to fomites during the famous Yellow Fever Experiments conducted in Cuba in 1901 by the U. S. Army Commission of which Major Walter Reed was chairman.

Promotions at Western Reserve.—Included among recent promotions at Western Reserve University School of Medicine, Cleveland, are:

Dr. Raymond C. McKay to associate clinical professor of medicine.
Dr. William Matthew Champion to assistant clinical professor of pediatrics.
Dr. Clarance W. Engler to assistant clinical professor of otolaryngology.
Alfred H. Free, Ph.D., to assistant professor of biochemistry.
Dr. Simon Koletsky to assistant professor of pathology.
Dr. Frederick Robert Mautz to assistant professor of surgery.

Personal.—Dr. Charles A. Doan, professor of medicine and director of medical research at Ohio State University College of Medicine, Columbus, was recently chosen president of the Ohio Public Health Association.——Dr. Lena M. English, resident physician at the Kent State University, Kent, has been appointed associate professor of health and physical education, succeeding Dr. Elizabeth A. Leggett, who resigned to go to Chicago. The latter had held the position since January 1935. ——Dr. Charles T. Dolezal has been appointed superintendent of the City Hospital, Cleveland, succeeding Mr. George P. Bugbee. Dr. Dolezal has been city welfare director since 1942. —— Dr. Ward D. Coffman, Zanesville, has been appointed chairman of the Ohio State Board of Health, succeeding Mrs. C. T. LaCost, Toledo.——Dr. Sydney J. Heeley, Barton, has been appointed health commissioner of Jefferson County.

SOUTH CAROLINA

Medical Students Campaign Against Wagner Bill.—Students at the Medical College of the State of South Carolina, Charleston, adopted a resolution at a meeting, August 12, registering their opposition to the Wagner-Murray-Dingell Bill (S. 1161). At the meeting the students unanimously backed the stand of the Charleston County Medical Society, which also recently indicated its opposition to the bill. Students at South Carolina proposed to enlist the support of students in the accredited medical colleges of the United States to protest and prevent the passage of the bill, newspapers report.

Changes in Health Officers.—Dr. Charles E. Ballard, Allendale, former health officer for Oconee and Pickens counties, has been appointed health officer for Beaufort County. Dr. Edmond J. Bryson, Liberty, former health officer of Greenwood County, will now serve in this capacity in Oconee and Pickens counties, and Dr. Mauldin J. Boggs Jr., Abbeville, health officer of Abbeville and McCormick counties, will also direct the Greenwood county health department until a successor to Dr. Bryson is named.——The Sumter County Board of Health is the result of the consolidation of the city of Sumter and Sumter County under the direction of Dr. Edward Alex Heise.——The health departments of Colleton and Hampton counties have been combined into one unit under the direction of Dr. Lloyd W. Luttrell, Walterboro.——Dr. Charles P. Pope Jr., health officer of Chesterfield-Marlboro Health District, has been appointed to a similar position in Aiken County.

TEXAS

McReynolds' Library Given to Texas University.—The medical library of the late Dr. John O. McReynolds, Dallas, was donated recently to the University of Texas Medical Branch, Galveston, by Mrs. F. W. Wozencraft, Washington, D. C., daughter of Dr. McReynolds. In addition to a large collection of medical books the gift contains lantern slides, motion picture films and a group of specimens.

Appointments to the Faculty at Baylor.—Recent appointments to the faculty of Baylor University College of Medicine, Houston, include the following:

Dr. James A. Greene, professor of medicine and chairman of the department and dean of the clinical faculty.
Dr. Judson L. Taylor, professor and chairman of the department of surgery.
Dr. Herman W. Johnson, professor of obstetrics and chairman of the department.
Dr. James H. Park Jr., professor of pediatrics and chairman of the department.
Dr. Ernst W. Bertner, professor of gynecology and chairman of the department.
Dr. James Greenwood, professor and chairman of the department of neuropsychiatry.
Dr. Culver M. Griswold, professor and chairman of the department of dermatology and syphilology.
Dr. Everett L. Boar, professor and chairman of the department of ophthalmology.
Dr. Claude C. Cody Jr., chairman of the department of otolaryngology.
Dr. Joseph B. Foster, professor of orthopedic surgery and chairman of the department.
Dr. Herbert T. Hayes, professor of proctology and chairman of the department.
Dr. John M. Trible, professor of urology and chairman of the department.
Dr. Stuart Anderson Peoples of the University of Alabama School of Medicine, University, professor of pharmacology.

VERMONT

Rehabilitation Program for Tuberculous.—The trustees of the Vermont Tuberculosis Association have appropriated $3,000, which will be matched by federal funds, to establish a special rehabilitation program for the tuberculous in the state. The money will be expended under the supervision of the committee on rehabilitation of the association in consultation with the rehabilitation division of the state department of education and physicians in the state sanatoriums.

GENERAL

Bar Association Opposes Medical Control by Government.—The American Bar Association at its sixty-sixth annual meeting at the Drake Hotel, Chicago, August 26, approved a resolution opposing any legislation now before Congress which "seeks to establish federal control of the medical profession, and the regimentation of doctors and hospitals," newspapers report.

New Medical Director of Nursing Service.—Dr. James M. Fraser, formerly of Lawton, Okla., has been appointed medical director of the Frontier Nursing Service, effective August 21. He succeeds Dr. John H. Gooser, Hyden, Ky., who has joined the armed services. Dr. Fraser graduated at George Washington University School of Medicine, Washington, D. C., in 1939.

American Home Products Acquires Gilliland Laboratories.—The American Home Products Corporation announces the acquisition of Gilliland Laboratories, Inc., of Marietta, Pa., producer and distributor of serums, vaccines and antitoxins. The management of the laboratories will remain unchanged but its production and sales will round out the lines of pharmaceuticals and biologic products now marketed by John Wyeth and Brother Inc., Reichel Laboratories, Inc., and Ayerst, McKenna & Harrison.

Annual Mississippi Valley Meeting.—The ninth annual session of the Mississippi Valley Medical Society will be held at the Hotel Lincoln-Douglas, Quincy, Ill., September 29-30. Among the speakers will be:

Dr. Warren H. Cole, Chicago, Treatment of Toxic Goiter.
Capt. Henry L. Dollard (MC), U. S. Navy, Tasks of the Medical Department of the U. S. Navy in Global War.
Dr. Norris J. Heckel, Chicago, Cystitis: Causes and Treatment.
Dr. Robert W. Keeton, Chicago, Treatment of Patients with Toxic Hepatitis.
Dr. Paul B. Magnuson, Chicago, The Misused and Misinterpreted Intervertebral Disk.
Dr. Raymond W. McNealy, Chicago, Cancer of the Large Bowel.
Dr. Carl M. Peterson, Secretary of the Council on Industrial Health of the American Medical Association, Industry Needs the Physician.
Dr. Charles H. Phifer, Chicago, Accomplishments and Difficulties Encountered by Procurement and Assignment Service.
Dr. Malcolm M. Cook, St. Louis, Rabies from the Practitioner's Point of View.
Dr. Willis M. Fowler, Iowa City, Diagnosis and Treatment of the Common Anemias.
Dr. Rutherford B. H. Gradwohl, St. Louis, Facts About Rh Agglutinogen.
Lieut. Comdr. Paul W. Greeley (MC), U. S. Naval Reserve, Some Personal Experiences in Current Military Plastic Surgery.
Dr. Samuel F. Haines, Rochester, Minn., Treatment of Parathyroid Insufficiency.
Dr. Joseph V. Herzog, Milwaukee, Office Procedures in Minor Rectal Pathology.
Dr. Archibald L. Hoyne, Chicago, Improved Methods in Treatment of Meningitis.
Dr. Julius Jensen, St. Louis, Cardiology.
Dr. John de J. Pemberton, Rochester, Some Problems in the Surgical Management of Carcinoma of the Colon and Rectum.
Dr. George J. Rukstinat, Chicago, Clinicopathologic Conference.
Dr. Leroy Hendrick Sloan, Chicago, Vertigo and Common Associations.
Dr. Thomas Bell Williamson, Mount Vernon, Ill., Importance of Good Prenatal Care in Obstetrics.

On Thursday evening, September 30, the speakers will be Brig. Gen. Fred W. Rankin, M. C., U. S. Army; Dr. George W. Post, Chicago; Dr. Andrew W. McAlester, Kansas City, Mo., and Dr. Edward M. Myers, Woodward, Iowa. Additional information may be obtained from the secretary, Dr. Harold Swanberg, Quincy.

Leprosy Study for Latin American Physicians.—In cooperation with the Office of the Coordinator of Inter-American Affairs and the U. S. Public Health Service, the Leonard Wood Memorial has undertaken a program of study for eight Latin American physicians who are especially interested in leprosy. The program, which opened on June 1 for a period of one year, will be divided as follows: the National Leprosarium, the U. S. Marine Hospital at Carville, La., for instruction by the regular staff and special consultant in various phases of leprosy; Western Reserve University for epidemiology, pathology and dermatology; the University of Michigan for bacteriology; Tulane University of Louisiana School of Medicine and Louisiana State University School of Medicine, New Orleans, for parasitology, hematology and

physical diagnosis and epidemiology. Before returning to their respective countries the physicians will visit various American cities to observe methods of medical, hospital and public health services. The physicians were guests of Perry Burgess, president of the Leonard Wood Memorial, at his home at Erie Vista, Geneva on the Lake, Ohio, from August 6 to 15, during which time several conferences on leprosy were held. The visitors are:

Dr. Alberto Caballero Villaveces, Colombia, assistant doctor of the National Lazareto de Agua de Dios.

Dr. Luis Rendon Ch, Ecuador, director del Leprosorio Nacional de "Verdecruz."

Dr. Augusto Rodolfo Mercau, Argentina, head of clinic of leprosy service; assistant physician in chair of dermatology.

Dr. Rafael Cepeda R., Colombia, medical director of the "Lazaretto of Caño de Loro."

Dr. Eduardo Carboni, Argentina, head of dependents section of the leprosy service, Hospital Carrasco, Rosario; assistant physician to the chair of dermatology; physician of department of prophylaxis and antivenereal diseases; head of dermatology service to primary schools of Rosario; consulting physician of "Patronato de Leprosos," Rosario.

Dr. Artur Porto Marques, Brazil, assistant of the Institute Evandro Chaga, Belém, Pará, Brazil.

Dr. Glynne Leite Rocha, Brazil, physician under contract in the National Service of Leprosy, Public Health Department; assistant at the dermatologic clinic of the University of Brazil.

Dr. Roberto Nunez Andrade, Mexico, medical officer in the Office of Prophylaxis of Leprosy in the federal department of health; dermatologist, department of welfare; professor of dermatology, National School of Biological Sciences of the National Polytechnic Institute; chief of dermatology clinic in the National School of Medicine.

Mr. Burgess was to be appointed consultant to the Secretary of War on epidemic diseases in a new project of assistance of the memorial to the Surgeon General of the U. S. Army. Dr. Norvin C. Kiefer, Geneva, has been appointed medical assistant to Mr. Burgess in his capacity as president of the memorial. He is engaged in research on leprosy. He graduated at the University of Michigan School of Medicine, Ann Arbor, in 1930 and is director of internal medicine and diagnostic laboratories of the A. S. Hickok Memorial Hospital, Geneva.

HAWAII

Epidemic of Dengue Fever.—An epidemic of dengue fever in Honolulu, originating in the Waikiki Beach area, has become citywide with 39 cases reported, and on August 14 the Army barred military personnel from six more residential districts, newspapers announce. The Army Chemical Warfare Service is spraying insecticide in homes where cases are reported. The city's seven thousand air raid wardens are conducting a house to house check to eradicate breeding places of dengue carrying mosquitoes.

LATIN AMERICA

New Medical School Building.—The Faculty of Medical Sciences of Buenos Aires recently opened its new building, occupying one whole block on Paraguay, Junin, Charces and J. E. Uriburu streets. It consists of twenty floors and will house the faculties of medicine, biochemistry, pharmacology, odontology, the Institute of Pathologic Anatomy, the Pardo Maternity and the Pavilion for tabetic patients.

Health Activities in Latin America.—The increasing development of Latin American health activities is reflected in the brief accounts in the Newsletter of the Health and Sanitation Division of the Coordinator of Inter-American Affairs.

Construction.—New building projects constitute a major development in practically all of the republics. In Colombia this includes new hospitals in Antioquia, Zaragosa and Remedios and health centers in Magdalena, the Choco, La Guajira, Buenaventura. In El Salvador health centers are being planned for Santa Ana, San Salvador and Santa Tecla. The construction and equipment of a diet kitchen at the Public Health Nursing School was completed at Port-au-Prince, Haiti.

Venereal Disease.—A clinic is to be established at Corinto, Nicaragua, a naval base, to carry out a program of registration and periodic examination of prostitutes. Women found infected are to be placed in the venereal disease hospital at Managua until rendered noninfectious.

Health Education.—Four physicians from El Salvador left for the United States in June for special work: Dr. Jose Francisco Valiente for tuberculosis control study, first at Saranac Lake Sanatorium and then at other sanatoriums; Dr. Alberto Aguilar Rivas, to work for a degree of master of public health at the Johns Hopkins School of Hygiene and Public Health, Baltimore, and Drs. Victor Manuel Posada and Roberto Masferrer Pineda for study at the Johns Hopkins University School of Medicine for training as instructors in the National Medical School at El Salvador. In Guatemala, where the largest cinchona plantation in the Western Hemisphere is being developed (THE JOURNAL, June 12, p. 457) on a plantation known as "El Porvenir," the Servicio is working out a medical care program for the 3,000 laborers to be employed there. The work will include personal instruction, the furnishing of facilities for water supply, sewerage and other sanitary needs, new construction for living quarters and the installation of sanitary facilities for both new and old buildings.

Malaria.—Particular attention has been directed to malaria, an outbreak of which occurred in May in Buenavista, Colombia, involving more than 182 cases. In El Salvador, after a survey, laborers found with malaria parasites were treated by the National Department of Health. Special control measures have been instituted in San Miguel, Sonsonate and Acajutla; in Puerto Barrios, Guatemala, plans have been drawn to eliminate mosquito breeding places permanently in the El Confral and La Montanita swamps. At Port-au-Prince, the Pan American Airways has contributed $4,000 to defray partly the cost of installing a concrete masonry sewer. In Nicaragua Drs. Leonard S. Rosenfeld, M. A. Sanchez-Vigil and Mr. Ramiro Sanchez of the National Institute of Hygiene visited Esteli to study the sources of anopheline malaria vectors in the city and in the nearby road camp of Pan American Highway contractors.

FOREIGN

New Scientific Films.—"War Medicine on the Western Front," the latest film produced by Vladimir Karin and Nikolai Bodanov, shows the modern Russian science of war medicine, the problems confronting the medical service at the front, and methods of treatment and evacuation of wounded. According to the *Information Bulletin,* Embassy of U. S. S. R., four studios in the Soviet Union "are producing scientific and technical films and popular science subjects, with a total of 120 releases annually." Among these is a series "Ready for Air and Chemical Defense."

Research in Industrial Medicine.—The British Medical Research Council has arranged with the London Hospital for the establishment there of a department for research in industrial medicine, *Science* reports. Dr. Donald Hunter, physician to the hospital, has accepted a part time appointment to the staff of the council as physician in charge of the department; the council has appointed Drs. Kenneth Perry and Norman Spoor as research assistants. The hospital will be responsible for the treatment of cases under investigation. The department will undertake clinical research into disorders affecting industrial workers. The staff will also study such problems in other parts of the country. The department will also be responsible for teaching in the subject. The new arrangement supersedes one made last year for the appointment of a full time director of research in industrial medicine attached to the council's headquarters. The position had become vacant through the appointment of Dr. A. W. M. Ellis to the regius chair of medicine at the University of Oxford.

CORRECTION

"Hemolytic Syndromes."—In the review of this book (by Dr. William Dameshek and others, published by H. Jackman Company, P. O. Box 122, Essex Station, Boston), published in THE JOURNAL, July 31, the price was quoted at $1.50. Owing to increased printing costs for the second edition the present price is $2.25 per copy prepaid.

Government Services

Physicians Needed at St. Elizabeths Hospital

The U. S. Civil Service Commission announces that a number of junior medical officers are needed at St. Elizabeths Hospital, Washington. It is possible that women may be utilized in these positions, the appointments to be made as vacancies arise. The positions pay $2,000 a year plus $433 overtime pay. There is no age limit. According to the announcement these are fine opportunities for psychiatric residencies, and rotating internships are open to recent graduates of medical schools. Additional information may be obtained from the U. S. Civil Service Commission at Washington, first or second class post offices and civil service regional offices.

Foreign Letters

LONDON

(From Our Regular Correspondent)

July 10, 1943.

The Detection of Pulmonary Tuberculosis in Women

Mass radiography is being used on a large scale for the early detection of pulmonary tuberculosis. F. Temple Clive has given in *Tubercle* a review of the radiography of 30,000 women recruits for the Women's Auxiliary Air Force. The cases are to some extent selective, as every woman had previously been examined at a national service medical board. The youngest was 17½ years of age and the oldest 45. All were practically symptomless and those noted as having any symptoms admitted to their presence only after detailed history taking. All the women were on full duty, which included marching and physical training, yet this strenuous exercise did not give any patient cause to suspect that she was not perfectly well. The value of this new method of examination is shown by the fact that 102 cases of active tuberculosis were found. Calcified nodules and/or glands were seen in 286 cases. The absence of admitted symptoms was remarkable. After close questioning only 29 of the acutely involved admitted symptoms, chiefly lassitude, loss of weight and cough, in that order. Even 4 women with advanced tuberculosis were unaware of any symptoms although the prognosis was only a matter of weeks. In no less than 64 cases no significant history of any kind was obtained. In spite of the complete absence of symptoms almost half the cases had already passed beyond the early (or group 1) stage. Cavitation was present in 16 unilateral and 4 bilateral cases. Thus 20 patients required urgently admission to an institution for collapse therapy. Abnormal physical signs were found in the chest in 66 cases. This figure includes only cases in which signs were so definite that they should be discovered by physicians not specially trained in chest work and without x-ray aid. The sputum was positive in 18 cases, negative in 33 and entirely absent in no fewer than 51 (exactly half the active cases). These figures may be to some extent fallacious, as women tend to conceal that they have any sputum and in spite of advice are averse to expectoration. Clubbing of the fingers occurred in 12 cases, in 3 of which it was the only abnormal sign. In 136 cases inactive pulmonary tuberculosis was found. This is a percentage of 0.45; the 102 active cases give a percentage of 0.34. These percentages may be compared with those for male recruits to the Air Force, which were 0.22 and 0.36 respectively. Thus the total percentage for the women was 0.79 and for the men 0.58. Below the age of 20, active tuberculosis was found twice as common in women as in men and inactive tuberculosis thrice as common.

The Lessons of Wartime Feeding

Lord Horder, the president, in addressing the Food Education Society on the subject "Lessons Taught by Wartime Feeding," said that the war had found science just ready for a great acceleration in the study of nutrition. Science had gained much from being given a definite "brief," particularly through the amount of field work provided by wartime conditions. The two most essential foods—bread and milk—were the chief subjects of controversy. The bread situation had settled down with a compromise between extremists—those who pressed for wholemeal and those who hankered after white bread. It was the policy of the society to teach the virtues of wholemeal bread and it would press the government to encourage in every way its nationwide adoption. It would take possibly a decade to get absolutely clean milk, and steps toward that aim must be regarded as a long term policy. Pasteurization was the short term policy, for it destroyed the germs and left the food value untouched. Yet the government still hesitated to enforce pasteurization. If the machinery was not available, could not some steel be released for the preservation of life?

New Fellows of the Royal Society Whose Work Is of Medical Importance

The fellowship of the Royal Society (F.R.S.) is the highest scientific honor attainable in the country. It is conferred only on those who have done important original scientific work. In the recent list of new fellows are the following whose work is medical or of medical interest:

Prof. P. A. Buxton, director of the Department of Entomology, London School of Tropical Medicine. Distinguished for research in medical entomology with special reference to conditions under which insects responsible for the transmission of diseases multiply and the measures of control.

Ivan de Burgh Daly, professor of physiology in the University of Edinburgh. Distinguished as an originator of essential items of modern physiologic technic and for important contributions to the physiology of the circulation in the lungs and bronchial tubes.

Dr. A. J. Ewins, director of research of May & Baker (manufacturing chemists at whose works sulfapyridine and other drugs have been originated). He is distinguished for his chemical and biochemical research. His work in organizing an industrial research laboratory has led to some of the most important synthetic remedies in recent years.

Alexander Fleming, professor of bacteriology, St. Mary's Hospital. Distinguished for his contributions to bacteriology, immunology and chemotherapy.

G. A. R. Kon, research professor of chemistry at the Royal Cancer Hospital. Distinguished for researches in organic chemistry. His work on the polyterpenes has provided a basis for a number of important developments.

Prof. Wilder Penfield, director of Montreal Neurological Institute. Distinguished for his researches in neurohistology and as a neurosurgeon.

Success of Immunization Against Diphtheria

The Ministry of Health reports remarkably good results from immunization of children against diphtheria, which is now performed on a large scale in this country. In the county districts of Northamptonshire over 36,250 children under the age of 15 have been immunized since 1941. During that period only 1 of these children contracted the disease, and the attack was not so severe as to prove fatal. On the other hand, among over 19,400 children in the same county districts who had not been immunized there were 101 cases of diphtheria with 15 deaths. Among 8,000 children under the age of 5 years who had been immunized not a single case of diphtheria occurred, while among 9,200 children under 5 who had not been immunized there were 36 cases with 11 deaths.

The Ministry of Health also states that 46 per cent of children under the age of 5 have now been immunized in county districts of Nothants and 71 per cent of those between 5 and 15 years. The percentage for all ages up to 15 is 65. The ministry is carrying on a campaign to secure the immunization of at least 75 per cent of the child population of the country.

BUENOS AIRES

(From Our Regular Correspondent)

July 3, 1943.

Experimental Diabetes

Dr. Bernardo A. Houssay, head of the Instituto de Fisiología of the Faculty of Medicine of the University of Buenos Aires, and Dr. M. L. de Finis have reported results of experiments carried on in the institute. They concluded that removal of the thyroids does not change the course of pancreatic diabetes in dogs. The conclusion cannot be applied to diabetes in other animals. Administration of thyroid to normal dogs does not increase glycemia; however, it causes slight injury to the islands of Langerhans and in cases of provoked hyperglycemia may diminish the capacity of the insular tissue to form insulin. Diabetes with acute lesions of the beta cells of the islands of Langerhans may result from administration of thyroid to animals in which the pancreas has been reduced to about one fifth of its size or when the structure has been injured by administering extracts of the anterior lobe of the hypophysis. Diabetic symptoms become acute following the administration of thyroid to diabetic animals. The administration of both thyroid and anterior lobe of the hypophysis produces diabetic reactions more acute than those produced by the administration of the anterior lobe of the hypophysis alone. The rate of mortality is very high in animals which have been given the combined treatment for a long time; some animals which received the combined treatment were resistant, their pancreas showing supernormal secretion of insulin. The administration of a moderate dose of anterior lobe of the hypophysis added to that of thyroids produced permanent diabetes in one case.

Public Health in Chile

The public health improved in Chile in 1941. No epidemics were observed. Exanthematic typhus was no longer a menace. The outbreak of cerebrospinal meningitis which appeared in the cities Santiago and Valparaiso was promptly controlled. Typhoid has diminished. Drinking water supplies on the one hand and sewage on the other have been properly watched. Protection to mothers and infants has improved because of the establishment of proper centers of the government. The following clinics and hospitals were opened to the public in 1941: an ophthalmologic clinic of the Carlos van Buren Hospital of the city of Valparaiso, a clinic for skin and venereal diseases with 53 beds, a new wing with 144 beds for hospitalization of the Sanatorio de Peñablanca, and a wing with 300 beds for infants in the Casa Nacional del Niño. Under construction are an asylum for drug addicts in the Open Door Hospital and a hospital of 100 beds in the city of San Carlos. The construction of the Chillán hospital with 260 beds was recently finished. The Hospital Clínico of Concepción with 627 beds is to be finished very soon.

Tuberculosis in Argentina

Dr. A. A. Raimondi is head of the Department Lucha Antituberculosa of Public Health in Argentina. The 1941 report of the department was recently published. The lack of facilities in certain areas has resulted in a transfer of tuberculous patients from such areas to the capital of the country. The number of deaths from tuberculosis was 2,708 in 1941. There are seventy-five nurses who have specialized in tuberculosis and who graduated from the Escuela de Enfermeras Especializadas in tuberculosis. The Hospital Tornú is the most important tuberculosis hospital. Of 1,018 patients discharged from the hospital in 1941, 194 patients were clinically cured, 667 improved, 91 were unchanged, 39 grew worse and 27 did not show pulmonary lesions. BCG vaccination was administered in 1941 to 12,255 children. The total number of vaccinated children is now 90,722. Revaccination was given to 849 children. BCG vaccination is administered to noninfected adults.

Public Health in Ecuador

The 1942 official report on public health of Ecuador was recently published by the Ministry of Social Help and Work. The incidence of malaria, typhoid, exanthematic typhus, diphtheria, whooping cough and dysentery increased. There is an emergency need for an antimalarial crusade. A law was passed in 1941 for the establishment of the National Institute of Hygiene, which is partially supported by the Rockefeller Foundation. The latter will give 50 per cent of the expenses of the first year of the institute, 40 per cent on the second year and so on. The institute has departments of tropical medicine, malariology, entomology, parasitology, bacteriology and immunology, sections for vaccinations against smallpox and plague, and departments for the preparation of technical material, sterilization and other procedures. The minister of public health says that the amount of 2,300,000 sucres which is given by the government for expenses on public health is insufficient to cover the necessary needs for a population of 3,200,000 persons. As shown at the third Pan American Conference, Ecuador should have no less than 40,000,000 sucres for the necessary work on public health and sanitation.

Brief Items

A medical week, the Jornadas Internacionales de Gastroenterología y Nutrición, was held in Montevideo last February. There was a large attendance of Latin American gastroenterologists. The official topics discussed were segmental enteritis, pathologic relations between the colon and the pancreaticobiliary system, and proctology.

Drs. Arturo Amenghino and Eliseo Segura, professors of the otorhinolaryngologic clinic and of clinical medicine respectively of the Faculty of Medicine of Buenos Aires, recently resigned.

The Sociedad Argentina de Hidrología y Climatología Médica was established recently. It is a branch of the Asociación Médica Argentina. Drs. Juan José Beretervide and Emilio Corbiere are president and secretary respectively.

News

A Laboratorio de Investigaciones Histológicas e Histopatológicas was recently founded in Buenos Aires under the auspices of the Institución Cultural Española of the city. Dr. Pío del Río Ortega is the head of the laboratory, which was founded in honor of Dr. Santiago Ramón y Cajal. The journal *Archivos de Histología Normal y Patológica* is the organ of the new laboratories. Dr. Pío del Río Ortega is the editor. The headquarters of the journal are at Calle Fernando de Irigoyen número 672, Buenos Aires.

Marriages

PAUL ROBINSON MASSENGILL, Raleigh, N. C., to Miss Lila Pauline Wells of Greenwood, S. C., in Durham, N. C., July 5.

LEON S. EISENMAN, Chicago, to Miss Ida Sybil Weinstein of Old Orchard Beach, Maine, and St. Augustine, Fla., July 18.

LLOYD P. RUSSELL, Fletcher, N. C., to Miss Sarah Alice Vance of Birmingham, Ala., July 18, in Greenville, S. C.

GEORGE C. KEALHOFER, Kansas City, Mo., to Miss Mary K. Haughey of Billings, Mont., in Kansas City, June 26.

WILLIAM AVERY ELLIS JR., Winston-Salem, N. C., to Miss Claire Sullivan of Providence, R. I., July 15.

SPOTSWOOD ROBINS, Richmond, Va., to Miss Sara Emma Hutcherson of Reidsville, N. C., July 28.

MARION LUTHER MATHIAS to Miss Betty Estelle Merritt, both of Columbia, S. C., July 13.

MAURICE SIDNEY VITSKY to Miss Betty Jane Wallerstein, both of Richmond, Va., June 27.

AUSTIN H. SCHOEN to Miss Jeanette Shulman, both of Brooklyn, August 15.

JOHN W. PITTMAN to Miss Mildred Brevard, both of Belton, Texas, in June.

Deaths

Frederick Joseph Taussig ✠ St. Louis; Washington University School of Medicine, St. Louis, 1898; professor of clinical obstetrics and gynecology at his alma mater, where he had been instructor and lecturer in gynecology, associate in gynecology and in clinical gynecology and associate professor of clinical gynecology; vice chairman of the Section on Obstetrics and Gynecology of the American Medical Association in 1911 and 1924; member of the American Gynecological Society and president, 1936-1937; member of the Central Association of Obstetricians and Gynecologists and president, 1932-1933; member of the American Association for Cancer Research, American Radium Society, Missouri Maternal Health Association and the St. Louis Surgical Club; member of the Missouri Social Hygiene Society and formerly vice president; member of the American Society for the Control of Cancer and in 1938 a director; fellow, a founder and formerly a member of the board of governors of the American College of Surgeons; served as a member of the state cancer commission; specialist certified by the American Board of Obstetrics and Gynecology, Inc.; formerly clinical assistant, surgeon to the outpatients and chief of gynecologic outpatient clinic, Washington University Hospital; assistant superintendent of the Female Hospital from 1898 to 1901; on the staffs of the Barnard Free Skin and Cancer, Barnes, Jewish, St. Louis City and St. Louis Maternity hospitals; author of "Diseases of the Vulva," 1923; "Abortion, Spontaneous and Induced, Medical and Social Aspects," 1935; contributed one or more chapters to Lewis's Surgery, Nelson's Looseleaf Medicine, Nelson's Looseleaf Surgery, Curtis's Obstetrics and Gynecology, Davis's Obstetrics and Gynecology, Brennemann's Pediatrics and Christopher's Surgery; aged 70; died in Bar Harbor, Maine, August 21, of pneumonia.

Robert Lide Carroll ✠ Los Angeles; University of Pennsylvania School of Medicine, Philadelphia, 1926; diplomate of the National Board of Medical Examiners; specialist certified by the American Board of Orthopaedic Surgery, Inc.; member of the American Academy of Orthopaedic Surgeons; secretary of the Los Angeles Chapter of the Western Orthopaedic Association and the Western Orthopaedic Association; lecturer in the department of physical education at the University of Southern California; chief of the orthopedic service of the California Hospital; director of the department of survey and fact finding, Orthopaedic Hospital; orthopedic consultant to the Riverside (Calif.) County Hospital; member of the staff of the Methodist Hospital of Southern California; aged 48; died, June 7, of brain tumor.

Minford Armour Hanna ✠ Kansas City, Mo.; Kansas City Medical College, 1903; specialist certified by the American Board of Obstetrics and Gynecology, Inc.; past president of the Jackson County Medical Society; fellow of the American College of Surgeons; gynecologist and obstetrician to the Trinity Lutheran, Kansas City General, St. Mary's, St. Joseph, Menorah and St. Luke's hospitals, Kansas City, Mo., and the Providence Hospital, Kansas City, Kan.; wrote a historical sketch on the Jackson County Medical Society of Missouri, 1881-1931; aged 65; died, August 24, of heart disease.

Clifton Price Bullard, Miami, Fla.; Georgia College of Eclectic Medicine and Surgery, Atlanta, 1910; member of the Florida Medical Association; aged 56; died suddenly, May 25, of diabetes mellitus and heart disease.

George P. Connolly, Minneapolis; Chicago Homeopathic Medical College, 1887; aged 84; died, June 5, of heart disease.

James Henry Crosswhite, Columbia, Mo.; Rush Medical College, Chicago, 1884; aged 85; died, April 1, of pneumonia.

George Deacon ✠ Pasadena, Calif.; Rush Medical College, Chicago, 1885; on the staffs of the Collis P. and Howard Huntington Memorial and St. Luke hospitals; aged 87; died, May 23, of arteriosclerosis.

Miles Jordan Duncan, Pacific Palisades, Calif.; Keokuk (Iowa) Medical College, 1892; University of Pennsylvania Department of Medicine, Philadelphia, 1894; practiced medicine in Dallas, Texas, for nineteen years; served as a captain in the medical corps of the U. S. Army during World War I; associated with the U. S. Veterans Bureau as a rating specialist (medical) at Sawtelle, and retired from active service two years ago; aged 70; died, May 18, of coronary thrombosis.

Ruth Marguerite Easterling, Cambridge, Mass.; Tufts College Medical School, Boston, 1921; aged 45; director of the laboratories of the Cambridge City Hospital, where she died, June 16, of carcinoma of the breast with metastases to the brain.

Carl De Witt Fisher, Denver; Denver Homeopathic College, 1907; formerly active in the Colorado National Guard; aged 66; died, June 20, of diabetes mellitus.

Bart Fitzpatrick, Columbus, Ind.; Medical College of Ohio, Cincinnati, 1882; aged 84; died, June 15, of myocarditis.

Barton D. Flaniken, Vernon, Texas; Fort Worth School of Medicine, Medical Department of Fort Worth University, 1907; member of the State Medical Association of Texas; served as medical examiner for the county draft board; on the staff of the Christ the King Hospital; aged 65; died, June 26, of arteriosclerosis.

Hudson Will Fleischhauer, Port Angeles, Wash.; University of Michigan Medical School, Ann Arbor, 1923; member of the Washington State Medical Association; on the staffs of the Port Angeles General and Davidson and Hay hospitals; formerly on the staff of the Seattle Hospital; served during World War I; aged 47; died at Irons, Mich., June 29, of cerebral hemorrhage.

Otto Gustav Frischbier, Brooklyn; Long Island College Hospital, Brooklyn, 1897; member of the Medical Society of the State of New York; aged 74; died, June 11, of chronic myocarditis and auricular fibrillation.

Julian Forrest Gardner, Winter Park, Fla.; Louisville (Ky.) Medical College, 1890; member of the Florida Medical Association; served as city physician and physician to the Rollins College; on the courtesy staff of the Orange General Hospital, Orlando; aged 71; died, June 19, in Orlando of uremia.

Teresa Olive Garrett, Brookport, Ill.; National University of Arts and Sciences Medical Department, St. Louis, 1916; health officer; local surgeon for the Illinois Central Railroad; aged 61; died, June 17, of myocarditis, edema of the lungs and arthritis.

Alexander J. Gordon, Jesup, Ga.; University of Georgia Medical Department, Augusta, 1888; member of the Medical Association of Georgia; past president and secretary of the Wayne County Medical Society; for many years a member of the city council; examiner for the local Selective Service System; aged 81; died, June 8, of heart disease.

Frederick Charles Heckel ✠ Larchmont, N. Y.; University and Bellevue Hospital Medical College, New York, 1901; also a pharmacist; formerly chief of clinic, visiting physician and member of the medical board of Harlem Hospital; aged 78; died, June 7, of cerebral hemorrhage.

Thomas W. Hester, Newberg, Ore.; University of Oregon Medical School, Portland, 1905; member of the Oregon State Medical Society; on the staffs of the Portland (Ore.) Sanitarium and Hospital and the Willamette Hospital; aged 65; died, June 1, of coronary thrombosis.

Frederick Sherwood Honsinger, Bayside, N. Y.; Syracuse University College of Medicine, 1898; aged 69; died, June 20, in Jamaica of cerebral sclerosis, pulmonary edema and embolus.

William Lyman Hood, Oakland, Calif.; Hahnemann Hospital College of San Francisco, 1897; College of Physicians and Surgeons of San Francisco, 1902; formerly health officer of Sonora and of Tuolumne County; served on the staff of the Sonora (Calif.) Hospital; aged 77; died, June 1, of cerebral embolism and thrombosis due to arteriosclerosis.

Otto John Jirsa, Oak Park, Ill.; Chicago College of Medicine and Surgery, 1916; on the courtesy staff of the Hospital of St. Anthony de Padua, Chicago; aged 48; died suddenly, June 14.

Harriet B. Jones, Glen Dale, W. Va.; Woman's Medical College of Baltimore, 1884; at one time a member of the state legislature; aged 87; died, June 28.

Harry Koster ✠ Brooklyn; Long Island College Hospital, Brooklyn, 1914; fellow of the American College of Surgeons; on the staffs of the Crown Heights and the Long Beach hospitals; aged 50; was killed, June 2, when he fell from a horse.

Edward J. Laval, Evansville, Ind.; Louisville (Ky.) Medical College, 1902; at one time served as county coroner; aged 73; died, June 3, in the Welborn-Walker Hospital of arteriosclerosis and cardiovascular disease.

James Aloysius McCreedy, New York; Long Island College Hospital, Brooklyn, 1899; aged 72; died, June 13.

John Eugene McLaughlin, Statesville, N. C.; University of Maryland School of Medicine, Baltimore, 1886; member and at one time vice president of the Medical Society of the State of North Carolina; formerly secretary-treasurer of the Iredell-Alexander Counties Medical Society; aged 80; died in Troutmans, June 24, of carcinoma of the foot.

Edward B. Nelson ✠ Spokane, Wash.; Medical Department of Tulane University of Louisiana, New Orleans, 1895; past president of the Spokane County Medical Society; aged 73; on the staff of the Deaconess Hospital, where he died, June 18, of arteriosclerotic hypertensive heart disease.

William Payne Nichols, Bloomfield, Ky.; Hospital College of Medicine, Louisville, Ky., 1903; aged 62; died, June 26, of peptic ulcer.

Albert O'Bannon, Okeechobee, Fla.; American Medical College, St. Louis, 1911; aged 69; died, June 13, of cerebral hemorrhage.

John Francis O'Brien, Fall River, Mass.; McGill University Faculty of Medicine, Montreal, Que., Canada, 1910; member of the Massachusetts Medical Society; police surgeon; on the staff of St. Anne's Hospital; aged 57; died, June 11, of tumor of the kidney.

Amos Cameron Olmsted ✠ Wells, Nev.; Cooper Medical College, San Francisco, 1895; past president of the Nevada State Medical Association and the Nevada State Board of Medical Examiners; past president and secretary of the Elko County Medical Society; member of the board of education and county health officer; on the staff of the Elko General Hospital; for ten years had been regent of the University of Nevada, Reno; aged 71; died, June 14, of uremia and nephrolithiasis.

Meade B. Owens ✠ Newport, Ark; Gate City Medical College, Texarkana, Ark., 1903; served as health officer of Jackson County; aged 70; died, June 20, of arthritis.

Alfonso Maria Padilla, Youngstown, Ohio; Jefferson Medical College of Philadelphia, 1914; aged 53; died, June 16, of heart disease.

Carl Pangerl, Muskegon Heights, Mich.; Chicago College of Medicine and Surgery, 1917; member of the Michigan State Medical Society; aged 49; on the staffs of the Mercy Hospital and the Hackley Hospital, Muskegon, where he died, June 13, of lobar pneumonia.

Dorsey C. Peck ✠ Grafton, W. Va.; Louisville (Ky.) Medical College, 1905; aged 65; died, June 15, of carcinoma.

William Marcus Petersen, Chicago; Milwaukee Medical College, 1902; also a pharmacist; member of the staff of the Lutheran Deaconess Home and Hospital; aged 67; died, June 23, of cerebral hemorrhage, chronic nephritis, chronic myocarditis and coronary occlusion.

Sterling Blackwell Pierce, Weldon, N. C.; Bellevue Hospital Medical College, New York, 1897; aged 69; died, June 23, in the Duke Hospital, Durham, of septicemia.

William Arthur Pike, Ottawa, Ill.; Rush Medical College, Chicago, 1896; formerly a member of the Illinois National Guard; veteran of the Spanish-American War; at one time city health officer; aged 69; died, June 25, in the Elgin (Ill.) State Hospital of hypertension and arteriosclerosis.

Frank E. Piner, Denton, Texas; Medical Department of Tulane University of Louisiana, New Orleans, 1894; past president and secretary of the Denton County Medical Society; member of the State Medical Association of Texas; health officer of Denton; aged 73; died in the Denton Hospital and Clinic, June 30, of malignancy of the gastrointestinal tract.

Harry Thomas Prideaux ✠ Cresson, Pa.; Medico-Chirurgical College of Philadelphia, 1908; member of the staff of the Mercy Hospital, Altoona; physician for the Pennsylvania Railroad Company and the Pennsylvania Coal and Coke Corporation; medical member of the civilian defense council of Cresson; aged 64; died, June 12, of coronary thrombosis.

James R. Rankin, Muncy, Pa.; University of Pennsylvania Department of Medicine, Philadelphia, 1883; member of the Medical Society of the State of Pennsylvania; a member and president of the board of health of Muncy; served during World War I; aged 82; died, June 21, in the Williamsport (Pa.) Hospital of aneurysm.

Hyman Rapaport ✠ Los Angeles; University of Pittsburgh School of Medicine, 1919; assistant clinical professor of medicine at the University of Southern California School of Medicine; specialist certified by the American Board of Internal Medicine; on the staffs of the Cedars of Lebanon and the Los Angeles County General hospitals; aged 50; died, June 16, of coronary thrombosis.

Frederick Edward Rehfeldt ✠ Jackson, Miss.; University of Nashville (Tenn.) Medical Department, 1904; member of the Southeastern Surgical Congress; member of the Selective Service System; for many years physician for the fire department; member of the staffs of the Mississippi Baptist Hospital and the Jackson Infirmary, where he died, June 8, of leukemia, aged 62.

Ellsworth Milton Tench ✠ Buffalo; University of Buffalo School of Medicine, 1917; consulting proctologist to the J. N. Adam Memorial Hospital, Perrysburg; aged 54; died, June 1, of cerebral thrombosis, hemiplegia, arteriosclerosis and hypertension.

Charles Wesley Thomas, Warren, Ohio; Western Reserve University Medical Department, Cleveland, 1903; member of the Ohio Medical Association; for many years chief surgeon for the Republic Steel Corporation; aged 66; died, May 17, in the University Hospital, Cleveland, of postoperative hemorrhage and benign enlargement of the prostate gland.

Frank Colfax Thornburgh, Alma, Mich.; Homeopathic Medical College of Missouri, St. Louis, 1904; on the staff of the R. B. Smith Memorial Hospital; aged 74; died, June 13, in the Saginaw (Mich.) General Hospital of chronic uremia and hypertrophy of the prostate.

Frank L. Thornburgh, Middletown, Ind.; Medical College of Ohio, Cincinnati, 1878; aged 86; died, June 7, in Fort Wayne of cardiovascular renal disease.

William W. Tindall ✠ Shelbyville, Ind.; Eclectic Medical Institute, Cincinnati, 1903; past president of the Shelby County Medical Society; examining physician for the county draft board during World War I and served in the same capacity recently; aged 66; died, June 18, of heart disease.

Andrew Jackson Turner, Beeville, Texas; Memphis (Tenn.) Hospital Medical College, 1901; member of the State Medical Association of Texas; for several terms president of the Bee-Live Oak-McMullen Counties Medical Society; for the past twenty-five years health officer of Beeville; served as a first lieutenant in the medical corps of the U. S. Army during World War I; on the staff of the Beeville Hospital; aged 71; died recently of coronary thrombosis.

Benjamin Franklin Underwood, Louisville, Ky.; Southwestern Homeopathic Medical College and Hospital, Louisville, 1910; member of the Kentucky State Medical Association; aged 57; died, June 7, in the Methodist Deaconess Hospital of cerebral hemorrhage.

Alan P. Vaughan, Arcade, N. Y.; University of Buffalo School of Medicine, 1896; member of the Medical Society of the State of New York; formerly health officer and school physician; aged 73; died, June 1, in the Buffalo General Hospital of carcinoma of the prostate, coronary heart disease and Laënnec's cirrhosis.

William Henry Wilson, Orlando, Fla.; College of Physicians and Surgeons, Boston, 1903; at one time on the staff of the Worcester (Mass.) City Hospital; aged 76; died, June 9, in the Florida State Hospital, Chattahoochee, of pneumonia.

James R. Wolfenden, Chicago; University of Michigan Department of Medicine and Surgery, Ann Arbor, 1897; aged 70; died, June 11, of chronic myocarditis.

Allen Henry Wright ✠ Northfield, Mass.; University of Maryland School of Medicine, Baltimore, 1906; member of the New England Society of Psychiatry; served as president of the Franklin District Medical Society; on the staffs of the Farren Memorial Hospital, Montague, Brattleboro (Vt.) Memorial Hospital and the Franklin County Public Hospital, Greenfield; aged 65; died, June 17, of cardiorenal disease.

George Wesley Younkin, Mason City, Iowa; State University of Iowa College of Medicine, Iowa City, 1876; formerly a minister; aged 96; died, May 16, of myocardial insufficiency.

KILLED WHILE IN MILITARY SERVICE

Ralph Robert Nix ✠ Passed Assistant Surgeon, U. S. Public Health Service, Springfield, Mass.; Louisiana State University School of Medicine, New Orleans, 1941; commissioned assistant surgeon in the reserve corps, U. S. Public Health Service, June 10, 1942; assigned to U. S. Marine Hospital, Mobile, Ala.; commissioned assistant surgeon in the regular corps, July 20, 1942; assigned as medical officer aboard Coast Guard Cutter *Escanaba,* Dec. 17, 1942; recommended for special commendation because of excellent services performed in rescue work of survivors of the S. S. *Dorchester;* promoted to grade of passed assistant surgeon, May 1, 1943; aged 26; killed at sea, June 14, when the *Escanaba* was destroyed following an "explosion of undetermined cause."

Correspondence

PREDICTION OF POLIOMYELITIS CASES IN EPIDEMIC YEARS

To the Editor:—Plotting the weekly trend of poliomyelitis in Chicago for the two highest years on record—1917 and 1937—revealed an interesting phenomenon common to the two years.

Histograms of the cases reported each week in these two years as well as that of 1943 are shown in chart 1; the cases in the first six months are not shown, as they were negligible. The trend starts up slowly for the first few weeks, then rapidly gathers momentum as the slope changes from a horizontal to a vertical position; on the way down from the peak the picture is almost duplicated.

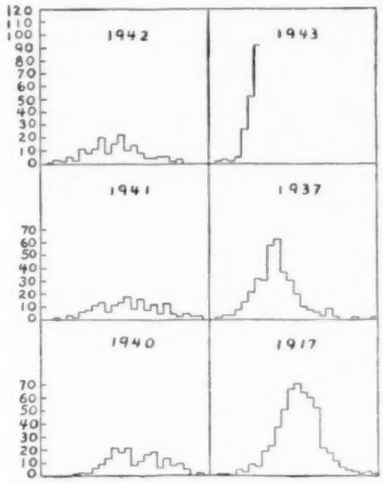

Chart 1.—Poliomyelitis morbidity, Chicago: Cases reported weekly, July-December 1940-43, 1937 and 1917.

Since case reports are likely to come in irregularly, a curve smoothed by three week moving averages was used in chart 2. The symmetry of the 1917 and 1937 curves is immediately apparent. The resemblance to a normal curve, even to the asymptotic tails on both ends, is remarkable. Also included in the chart are three recent years that did not stand out as epidemic years. Even with three week moving averages the values, although suggestive of a normal curve, were irregular. However, the probable explanation is that in high years, when the public is conscious of the disease, there is a likelihood of an almost complete reporting of the cases, whereas in off years mild forms are not so apt to be reported.

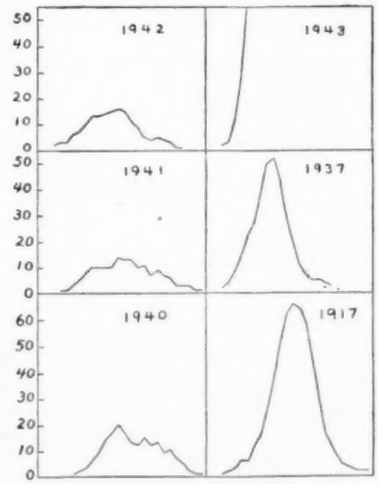

Chart 2.—Poliomyelitis morbidity, Chicago: Three week moving average, July to December 1917, 1937 and 1940-43.

The tendency for the disease course to approximate the normal curve in its entirety offers the possibility of predicting in the early part of the season the complete picture for the year with a foreknowledge of weekly estimates, the peak week and a good estimate of the total cases for the year. According to the curve, the peak this year should occur the week of September 4. This can be done by noting from chart 2 that whenever the slope rises sharply it will continue so for five or six weeks and then repeat the same values on the way down. When the slope does not change rapidly, as is seen for 1940, 1941 and 1942, the peak week has a low total and the total cases for the year is correspondingly low.

Is there a hint from this evidence as to the nature of the disease itself? If a constant force should be exerted on a group, and at a certain time of the year for some reason that group lost some of its power to resist that force, a graph of the number of individuals bending under it would describe a normal curve.

Another method of approach which may be more fruitful in predictive possibilities is the plotting of the cumulative weekly data on a logistic curve. This is being given study.

HERMAN N. BUNDESEN, M.D., Sc.D.
President, Chicago Department of Health.

WILLIAM I. FISHBEIN, M.D.
Epidemiologist, Chicago Department of Health.

M. C. GOLTON.

REVIEW OF "DISEASES OF THE BREAST" BY CHARLES GESCHICKTER

To the Editor:—In your issue of July 17 you printed a book review of "Diseases of the Breast," published by the J. B. Lippincott Company.

The review is a departure from acceptable standards of printed comments of this nature in many respects. In the first place, being published in the official journal of the American Medical Association, which serves both specialists and practitioners, the review confines itself almost entirely to the controversial aspects of breast pathology and in no way gives the practitioner an adequate basis for judging the contents of the book or the merits of its presentation of the major facts concerning the diagnosis and treatment of mammary diseases.

Secondly, while the tone of the review is hypercritical, the reviewer does not quote directly the statements of the author criticized but confines himself to generalities, which in most instances proceed not from the book but from the opinion of the reviewer. Thus the main part of the review concerns the author's conclusions regarding the relation of chronic cystic mastitis to cancer, discussed in chapter 12. The reviewer states:

> The author arrives at the important conclusion that no etiologic relationship exists between chronic cystic mastitis and carcinoma and thus places himself in direct contradiction with an increasing body of opinion (Ewing, McCarthy, Konjetzny, Semb, Cheatle, Cutler and others). Warren's recent statistical studies also are opposed to the author's conclusions.

It is noted that this is not a direct quotation by the reviewer and nowhere in the book to the author's knowledge can any such statement be either found nor can it be implied. As a matter of fact, the exact opposite is stated repeatedly in chapter 12. Thus on page 265, in discussing the clinical data concerning the relation of these two diseases, the author concludes:

> The number of observed cases (in which chronic cystic mastitis and cancer coexist in the same patient) is twice as great as the expected figure and is of etiologic significance, although the figure is not high.

In discussing the microscopic data it is stated again on page 269:

> However, in 6 cases (6.6 per cent), the histologic appearance suggested origin (of cancer) in an area of mammary dysplasia (figs. 229-232).

and again on page 272 in discussing experimental data:

> To determine if the rat's breast under these conditions is more susceptible to cancer: After one and two years rats with such advanced adenosis were given extremely high doses of estrogen for a period of one to two months, thus simulating that which may occur at the menopause in women with long-standing adenosis (see chapter 34). Under these conditions, cancer occurred rapidly in all of the animals (figs. 233-236). Hence, long-standing adenosis in the human breast may predispose to cancer, if this is followed by adequate estrogenic stimulation near the menopause, or, more rarely, at other times in cyclic women.

The entire crux of the matter is then summarized in discussing the follow-up studies on page 276:

> On this basis, the incidence of mammary cancer in the 793 cases of chronic cystic mastitis is 0.88 per cent instead of the calculated 0.42 per cent. Among the cases of adenosis, the cancer incidence is 2 per cent or five times the expected figure; in cystic disease, 0.79 per cent or twice the expected figure; and in cases of mastodynia, below the calculated number, or zero per cent.
>
> The histories of the cases of mammary dysplasia in which carcinoma supervened follows:

As a matter of fact, throughout the book the relationship of the two diseases is repeatedly emphasized, pages 208, 217, 255, 257, 275, 761 and 800.

Not only does the reviewer misrepresent the conclusions of the author arrived at in chapter 12 but he also distorts the facts.

The reviewer states that large numbers of cases, as high as 70 per cent in some categories (note the generality, some categories) have no microscopic proof. But, in truth, in the tabulated follow-up studies of cystic disease and adenosis (which are the only forms of mammary dysplasia in which any one has assumed or claimed a relationship to cancer) 80 per cent of the 579 cases have microscopic verification. In cystic disease 350 of 387 diseases are microscopically verified, and in adenosis 113 of 192 cases.

The reviewer accepts unquestionably the studies made by Warren along similar lines, while attacking the studies of the author, claiming the two studies to be in opposition. He overlooks the fact that the two studies are in agreement. He is apparently unaware that the much maligned chapter 12 was submitted to Dr. Warren in proof form before publication and some of his suggestions were incorporated in it, to wit, as stated on page 280, in the paragraph beginning with

> The incidence of mammary cancer in patients with chronic cystic mastitis is too low to warrant mastectomy. This is the opinion of Warren and also of the author.

and ending with

> In those cases where a definite nodule develops, subsequent to the excision of a former nodule, in adenosis, a simple mastectomy may be advisable.

A further example of the way in which the reviewer has distorted the facts is illustrated in the statement:

> Studies of the breast by means of whole serial sections are opposed to the conclusions of Geschickter, who did not examine his specimens by Cheatle's method.

This assumption is entirely false and unwarranted, since many of the author's cases were thus studied, and by merely thumbing through the book and looking at the pictures this fact can be verified, for instance, figures 163, 179, 202, 242, 275, 285, 288, 289, 367, 368, 402 and 410.

A similar distortion of facts is found in the statement in regard to the author's classification of mammary carcinoma:

> Meaningless names are given to microscopic appearances of fragments of tissue from the breast.

This statement neglects the fact that the author devotes an entire chapter to each of the forms of mammary cancer presented in his classification, describing and basing the classification not on microscopic fragments but on a careful analysis of both clinical and pathologic features of the disease as well as its response and behavior under treatment, as determined by follow-ups. Not a single new classification of cancer has been introduced. The only novel departure is the introduction of the word "neomammary" for a group of rare cancers previously classified as cancer cysts and sweat gland cancers.

Charles Geschickter,
Lieutenant Commander, U.S.N.R.

SUBJECTIVE REACTION TO PROSTIGMINE IN TREATMENT OF POLIOMYELITIS

To the Editor:—The use of prostigmine in the treatment of poliomyelitis would seem to merit encouragement. Through circumstances explained below it was necessary to deal with the patient's subjective reaction to the drug, as well as with the objective findings.

A white girl aged 19 years, admitted to the Maine General Hospital in Portland, Maine, on Oct. 6, 1942 with the diagnosis of poliomyelitis, received the Kenny treatment there. On November 14, when she left the hospital, she was able to walk with difficulty on crutches through a small room. She continued taking exercises as advised in the hospital, though she improved slowly. In April 1943 she was started on prostigmine bromide and thiamine hydrochloride. The doses used were 15 mg. of prostigmine bromide and 5 mg. of thiamine hydrochloride given orally three times a day. Since she lived 15 miles away and it was impossible to observe the course of the convalescence closely, she was urged to keep a diary. The patient's diary reads as follows:

"The week before I started taking the pills I tired very easily, both while sitting and while standing and walking. I started taking the pills on a Monday and the following Wednesday I began to feel better generally; that is, I could walk and sit longer without tiring. Thursday I noticed an improvement in the muscle in the back of my leg while doing exercises (lying on stomach and lifting whole leg straight up). Friday I noticed an improvement in the muscle which takes my leg out to the side (lying on back, pushing leg out to right side). The second week of taking the pills I didn't seem to notice any definite improvement in any one muscle, it just seemed to be all over. I can walk much farther and longer than I could, but I still limp almost as much."

Before taking prostigmine she could walk through three rooms once a day. She could not abduct or flex the right thigh. After taking it for four days she could perform both exercises, abducting and flexing the right thigh. After taking it for a week she could walk through the same three rooms seven times a day. She also could sit up without aching. She retained all the improvement derived from the treatment.

It is felt that the earlier prostigmine is used in the course of any case of poliomyelitis the better the results will be. Victims of the disease should not be deprived of a trial of this drug, regardless of the time since the onset of the disease.

George Geyerhahn, M.D., South Portland 7, Maine.

TOXIC ERUPTIONS DUE TO AMPHETAMINE SULFATE

To the Editor:—In the treatment of over 2,000 cases of obesity, in which between one-third and one-half million 10 mg. tablets of amphetamine sulfate were used, there were only 2 cases of skin eruptions similar to those described by Kauvar, Henschel and Ravin in the August 14 issue of The Journal.

A careful history and time-taking checking on both patients revealed that each had had a similar eruption prior to taking amphetamine sulfate. Both admitted that when they ate too much tomatoes, veal, pineapple, strawberries and other acid foods these eruptions were sure to appear.

The patients were then instructed to omit these foods, take some milk of magnesia for a while, and to apply phenolated calamine lotion locally. These eruptions soon cleared, although amphetamine was not discontinued but even increased in dosage for the following week.

Jack S. Ersner, M.D., Philadelphia.

Medical Examinations and Licensure

COMING EXAMINATIONS AND MEETINGS

NATIONAL BOARD OF MEDICAL EXAMINERS EXAMINING BOARDS IN SPECIALTIES

Examinations of the National Board of Medical Examiners and Examining Boards in Specialties were published in THE JOURNAL, Aug. 14, page 1125.

BOARDS OF MEDICAL EXAMINERS

ALABAMA: Montgomery, June 20-22. Sec., Dr. B. F. Austin, 519 Dexter Ave., Montgomery.

ARIZONA: * Phoenix, Oct. 5-6. Sec., Dr. J. H. Patterson, 826 Security Bldg., Phoenix.

ARKANSAS: * *Medical.* Nov. 3-4. Sec., Dr. D. L. Owens, Harrison. *Eclectic.* Little Rock, Nov. 4. Sec., C. H. Young, 1415 Main St., Little Rock.

CALIFORNIA: *Written.* Sacramento, Oct. 18-21. Sec., Dr. Frederick N. Scatena, 1020 N Street, Sacramento.

COLORADO: * Denver, Oct. 5-8. Final date for filing application is Sept. 20. Sec., Dr. J. B. Davis, 831 Republic Bldg., Denver.

CONNECTICUT: * *Written.* Hartford, Nov. 9-10. *Endorsement.* New Haven, Nov. 23. Sec. to the Board, Dr. Creighton Barker, 258 Church St., New Haven.

DISTRICT OF COLUMBIA: * Washington, Nov. 8-9. Sec., Commission on Licensure, Dr. G. C. Ruhland, 6150 E. Municipal Bldg., Washington.

FLORIDA: * Jacksonville, Nov. 22-23. Sec., Dr. William M. Rowlett, Box 786, Tampa.

IDAHO: Boise, Jan. 11. Dir., Bureau of Occupational Licenses, Mrs. Lela D. Painter, 355 State Capitol Bldg., Boise.

ILLINOIS: Chicago, Oct. 12-14. Superintendent of Registration, Department of Registration and Education, Mr. Philip M. Harman, Springfield.

INDIANA, Indianapolis, Sept. 14-16. Sec., Board of Medical Registration & Examination, Dr. W. C. Moore, 301 State House, Indianapolis.

IOWA: * Iowa City, Dec. 27-29. Dir., Division of Licensure and Registration, Mr. H. W. Grefe, Capitol Bldg., Des Moines.

KANSAS: Topeka, Dec. 14-15. Sec., Dr. J. F. Hassig, 905 N. Seventh St., Kansas City.

KENTUCKY: Louisville, Dec. 6-8. Sec., Dr. A. T. McCormack, 620 S. Third St., Louisville.

MAINE: Portland, Nov. 9-10. Sec., Dr. Adam P. Leighton, 192 State St., Portland.

MARYLAND: *Medical.* Baltimore, Dec. 14-17. Sec., Dr. J. T. O'Mara, 1215 Cathedral St., Baltimore. *Homeopathic.* Baltimore, Dec. 14-15. Sec., Dr. J. A. Evans, 612 W. 40th St., Baltimore.

MASSACHUSETTS: Boston, Nov. 16-19. Sec., Board of Registration in Medicine, Dr. H. Q. Gallupe, 413-F State House, Boston.

MICHIGAN: * Ann Arbor, Oct. 13-15. Sec., Board of Registration in Medicine, Dr. J. Earl McIntyre, 100 W. Allegan St., Lansing.

MINNESOTA: * Minneapolis, Oct. 19-21. Sec., Dr. J. F. DuBois, 230 Lowry Medical Arts Bldg., St. Paul.

MISSISSIPPI: Jackson, September. Asst. Sec., State Board of Health, Dr. R. N. Whitfield, Jackson.

MISSOURI: St. Louis, Nov. 15-17. Sec., State Board of Health, Dr. James Stewart, State Capitol Bldg., Jefferson City.

MONTANA: Helena, Oct. 5-6. Sec., Dr. O. G. Klein, First Nat'l Bank Bldg., Helena.

NEW HAMPSHIRE: Concord, Sept. 9-10. Sec., Board of Registration in Medicine, Dr. D. G. Smith, State House, Concord.

NEW JERSEY: Trenton, Oct. 19-20. Sec., Dr. E. S. Hallinger, 28 W. State St., Trenton.

NEW MEXICO: * *Endorsement.* Santa Fe, Oct. 11-12. Sec., Dr. LeGrand Ward, 141 Palace Ave., Santa Fe.

NEW YORK: Albany, Buffalo, New York and Syracuse, Sept. 20-23. Sec., Dr. R. R. Hannon, Education Bldg., Albany.

NORTH DAKOTA: Grand Forks, Jan. 4-7. Sec., Dr. G. M. Williamson, 4½ S. Third St., Grand Forks.

OHIO: *Endorsement.* Columbus, Oct. 7. *Written.* Columbus, Dec. 4. Sec., Dr. H. M. Platter, 21 W. Broad St., Columbus.

PENNSYLVANIA: Philadelphia and Pittsburgh, January. Act. Sec., Bureau of Professional Licensing, Department of Public Instruction, Mrs. Marguerite G. Steiner, 358 Education Bldg., Harrisburg.

RHODE ISLAND: * Providence, Oct. 7-8. Chief, Division of Examiners, Mr. Thomas B. Casey, 366 State Office Bldg., Providence.

SOUTH CAROLINA: Charleston, Dec. 20-22. Sec., Dr. N. B. Heyward, 1329 Blanding St., Columbia.

SOUTH DAKOTA: * Pierre, Jan. 18-19. Dir., Medical Licensure, State Board of Health, Dr. Gilbert Cottam, Pierre.

TENNESSEE: * Memphis and Nashville, Sept. 29-Oct. 1. Sec., Dr. H. W. Qualls, 1635 Exchange Bldg., Memphis.

VERMONT: Burlington, Dec. 15-17. Sec., Dr. F. J. Lawliss, Richford.

VIRGINIA: Richmond, Dec. 14-17. Sec., Dr. J. W. Preston, 30½ Franklin Road, Roanoke.

WEST VIRGINIA: Charleston, Oct. 25-27. Commissioner, Public Health Council, Dr. John E. Offner, State Capitol, Charleston.

WISCONSIN: * *Reciprocity.* Milwaukee, Sept. 13-14. Sec., Dr. C. A. Dawson, Tremont Bldg., River Falls.

WYOMING: Oct. 4-5. Sec., Dr. M. C. Keith, Capitol Bldg., Cheyenne.

* Basic Science Certificate required.

BOARDS OF EXAMINERS IN THE BASIC SCIENCES

ARIZONA: Tucson, Sept. 21. Sec., Dr. Robert L. Nugent, Science Hall, University of Arizona, Tucson.

COLORADO: Denver, Sept. 8-9. Sec., Dr. E. B. Starks, 1459 Ogden St., Denver.

CONNECTICUT: Oct. 9. Address State Board of Healing Arts, 250 Church St., New Haven.

DISTRICT OF COLUMBIA: Washington, Oct. 18-19. Sec., Dr. G. C. Ruhland, 6150 E. Municipal Bldg., Washington.

FLORIDA: DeLand, Nov. 6. Sec., Dr. John F. Conn, John B. Stetson University, DeLand.

IOWA: Des Moines, Oct. 12. Dir., Division of Licensure & Registration, Mr. H. W. Grefe, Capitol Bldg., Des Moines.

MINNESOTA: Minneapolis, Oct. 5-6. Sec., Dr. J. C. McKinley, 126 Millard Hall, Univ. of Minnesota, Minneapolis.

NEBRASKA: Lincoln, Oct. 5-6. Dir., Bureau of Examining Boards, Mr. Oscar F. Humble, 1009 State Capitol Bldg., Lincoln.

NEW MEXICO: Febr. 7. Sec., Miss Pia Joerger, State Capitol, Santa Fe.

OREGON: Portland, Oct. 30. Sec., State Board of Higher Education, Mr. C. D. Byrne, University of Oregon, Eugene.

SOUTH DAKOTA: Vermillion, December. Sec., Dr. G. M. Evans, Yankton.

TENNESSEE: Nashville and Memphis, Dec. 10-11. Sec., Dr. O. W. Hyman, 874 Union Ave., Memphis.

WISCONSIN: Madison, Sept. 18. Sec., Prof. R. N. Bauer, 152 W. Wisconsin Ave., Milwaukee.

Bureau of Legal Medicine and Legislation

MEDICOLEGAL ABSTRACTS

Medical Practice Acts: Revocation of License for Conviction of Crime Involving Moral Turpitude while Defendant Confined in Penitentiary.—Henry J. Schireson, who was licensed to practice medicine and surgery in New Jersey, was convicted, after a plea of nolo contendere in a federal court, of (1) unlawfully concealing assets from a trustee in bankruptcy, (2) making a false oath in bankruptcy proceedings and (3) perjury, and was sentenced to and confined in a federal penitentiary in Pennsylvania. Subsequently and while he was confined in the penitentiary a complaint was filed with the state board of medical examiners of New Jersey charging that he had been convicted of crimes involving moral turpitude, which is one of the grounds enumerated in the New Jersey medical practice act for the suspension or revocation of a license to practice medicine and surgery. The board accordingly notified Schireson in writing that it would, in Trenton, N. J., on Feb. 18, 1942, hold a hearing to consider whether or not it should suspend or revoke his license. On his request, made through his attorney, the hearing was postponed to March 18 and again to April 15 but the board would grant no further postponements and proceeded, on the date last mentioned, without Schireson's presence, with the hearing, ultimately revoking his license to practice. The federal convict brought certiorari in the supreme court of New Jersey to review the order of revocation.

It was contended that the revocation of Schireson's license was illegal because (1) the New Jersey medical practice act was unconstitutional in that it served to deprive him of liberty and property without due process of law and that, assuming the validity of the medical practice act, the course followed by the state board of medical examiners violated the constitutional safeguard referred to, (2) the order of revocation was not based on legal evidence and (3) the refusal of the board to grant further adjournment or continuance was capricious. The essence of Schireson's case, said the appellate court, is that the possession of his license was a property right and that the refusal of the board of medical examiners to continue the hearing of the charge against him until he was released from the penitentiary deprived him of the opportunity to defend and therefore was not due process; and ancillary to this is the contention that the record of criminal proceedings did not disclose an adjudication or a plea that he was guilty of the offenses for which he was indicted and that therefore he could not be subjected to the revocation of his license except on proof

of guilt produced before the state board on original charges of unlawful concealment of assets, false swearing, perjury, or whatever offense might be laid against him. It is not denied, continued the court, that the crimes for which he was sentenced by the federal court involved moral turpitude. The state board was authorized to proceed on proof, not that Schireson was guilty of the named crimes, but that he had been convicted of them; and it is not denied that the court record of the indictment, the pleas, the conviction and sentence, in fact the whole pertinent record, was put in evidence before the board.

Schireson, continued the court, had a legal claim to his license. We need not, however, determine whether his authority to practice in New Jersey was a privilege or a right or, if a right, whether just that or, more specifically, a property right. By whatever name, it was subject to the paramount right of government to protect the general health of the members of society—the police power. It was for the legislature to determine, within reasonable limits, what the tests of moral character in a physician should be. The circumstance that Schireson had already been licensed gave him no immunity against such legislation. *Lawrence* v. *Briry*, 239 Mass. 424, 132 N. E. 174. He had no vested right to practice after he had been found to have qualities inconsistent with good moral character. Character, as well as knowledge and skill, should be resident in one who would practice the art of healing and thus have intimate responsibility for the health and lives of human beings; and it is a reasonable exercise of legislative power to determine that a person who has committed a crime of moral turpitude is not such a one as should be permitted to practice medicine or surgery. It may be said with respect to the practice of medicine, as Justice Cardozo said with respect to the practice of law *In re Rouss*, 221 N. Y. 81, 116 N. E. 782, 783, in part as follows:

> Membership in the bar is a privilege burdened with conditions. A fair private and professional character is one of them. Compliance with that condition is essential at the moment of admission; but is equally essential afterwards.

The legislature of a state may enact that one who has been convicted of crime shall no longer practice medicine. *Hawker* v. *State*, 170 U. S. 189, 18 S. Ct. 573.

Schireson attempted to draw a technical distinction between a conviction and that congeries of events which began with his plea of nolo contendere and terminated in his being lawfully sentenced and in his submitting to the imprisonment which the sentence imposed. But, said the court, there can be no well grounded dissent from the proposition that so far as the state was concerned there was a conviction. True, there was no jury verdict of guilt and there was not a technical plea of "guilty," and if Schireson had been sued in a civil action he would have had the benefit in his defense of such rules as hinge on that distinction. But the proceeding before the board of medical examiners was not a civil action. In our opinion the proceedings in the federal court constituted a conviction within the meaning of the New Jersey medical practice act.

Schireson argued, however, that he was entitled, notwithstanding his conviction, to have his original guilt proved before the board of medical examiners by witnesses and exhibits as though there had been no conviction and as though the charge before the board was that he was guilty of the alleged offenses and not that he had been convicted of them. Clearly, said the court, that was not the requirement or the intent of the medical practice act and was not made necessary by any provision of the federal or of the New Jersey state constitution. It would be a strange eventuality for Schireson, after his guilt had been so plainly established with respect to the commission of the criminal offenses with respect to the practice of his profession, to be found not to have committed those crimes. This proceeding is merely one to give effect to a provision of the medical practice act relating to the practice of medicine and surgery which says that the board may revoke on the conviction of a crime of the designated class. As was said in *Hawker* v. *State*, 170 U. S. 189, 18 S. Ct. 577:

> The thought which runs through these [viz., the cited] cases and others of similar import which might be cited is that such legislation is not to be regarded as a mere imposition of additional penalty, but as prescribing the qualifications for the duties to be discharged and the position to be filled, and naming what is deemed to be and what is in fact appropriate evidence of such qualifications.

The only issue before the board of medical examiners was whether Schireson had been convicted of a crime involving moral turpitude; he had been so convicted and that fact was proved from the court records—competent evidence for that purpose. The question of guilt or innocence, as such, was not in issue; Schireson had had his day in court on that.

Schireson next contended that the New Jersey medical practice act was unconstitutional in that it did not require that an accused physician be notified of the proceedings or be given an opportunity to be heard and that the board of medical examiners acted unconstitutionally because its proceedings found him in such predicament, because of his imprisonment, that he could not attend. Be it observed, however, answered the supreme court, that while the medical practice act does not, where the cause for suspension or revocation is the conviction of a crime, require the "hearing"—really a trial—which it directs shall be accorded where the cause is the commission of an offense for which there has been no prior conviction, nevertheless it does provide that notice shall be given of the purpose of the board to sit in disciplinary session, and as a matter of fact notice was given of the session, and given in such fashion that Schireson had full advance knowledge thereof and indeed appeared by counsel to the extent of obtaining two adjournments. It is not a condition of due process that the defendant shall be, or shall be able to be, physically present at the hearing. The board's refusal to grant further adjournment was not capricious. The order of revocation contained an ample statement of the evidence on which the revocation was based.

The court concluded that neither the medical practice act nor the procedure followed in revoking Schireson's license was unconstitutional in the respects complained of, that the finding of the board of medical examiners was grounded in legal evidence and that its refusal to grant further adjournment was neither capricious nor otherwise illegal. The order revoking Schireson's license to practice was therefore affirmed.—*Schireson v. State Board of Medical Examiners of New Jersey, 28 A. (2d) 879 (N. J., 1942).*

Society Proceedings

COMING MEETINGS

American Academy of Ophthalmology and Otolaryngology, Chicago, Oct. 10-13. Dr. W. L. Benedict, 102 Second Ave. S.W., Rochester, Minn., Secretary.

American Congress of Physical Therapy, Chicago, Sept. 8-11. Dr. Richard Kovacs, 2 East 88th St., New York, Secretary.

American Public Health Association, New York, Oct. 12-14. Dr. Reginald M. Atwater, 1790 Broadway, New York, Executive Secretary.

Association of Military Surgeons of the United States, Philadelphia, Oct. 21-23. Colonel James M. Phalen, Army Medical Museum, Washington, D. C., Secretary.

Delaware, Medical Society of, Wilmington, Oct. 12-13. Dr. W. O. La Motte, 601 Delaware Ave., Wilmington, Secretary.

District of Columbia, Medical Society of the, Washington, Sept. 30-Oct. 2. Mr. Theodre Wiprud, 1718 M St. N.W., Washington, Secretary.

Indiana State Medical Association, Indianapolis, Sept. 28-30. Mr. T. A. Hendricks, 23 East Ohio St., Indianapolis, Executive Secretary.

Inter-State Postgraduate Medical Association of North America, Chicago, Oct. 26-29. Dr. Arthur G. Sullivan, 16 North Carroll St., Madison, Wis., Managing Director.

Kansas City Southwest Clinical Society, Kansas City, Mo., Oct. 4-6. Dr. William M. Korth, 1115 Grand Ave., Kansas City, Mo., Secretary.

Kentucky State Medical Association, Louisville, Oct. 4-6. Dr. P. E. Blackerby, 620 South Third St., Louisville, Acting Secretary.

Michigan State Medical Society, Detroit, Sept. 22-24. Dr. L. Fernald Foster, 2020 Olds Tower, Lansing, Secretary.

Mississippi Valley Conference on Tuberculosis, Chicago, Sept. 8-9. Mr. A. W. Jones, 613 Locust St., St. Louis, Secretary.

Mississippi Valley Medical Society, Quincy, Ill., Sept. 29-30. Dr. Harold Swanberg, 510 Maine St., Quincy, Ill., Secretary.

Oklahoma City Clinical Society, Oklahoma City, Oct. 18-21. Dr. Clark H. Hall, 117 North Broadway, Oklahoma City, Secretary.

Omaha Mid-West Clinical Society, Omaha, Oct. 25-29. Dr. J. D. McCarthy, 1036 Medical Arts Bldg., Omaha, Secretary.

Pennsylvania, Medical Society of the State of, Philadelphia, Oct. 5-7. Dr. Walter F. Donaldson, 500 Penn Ave., Pittsburgh, Secretary.

Virginia, Medical Society of, Roanoke, Oct. 25-27. Miss Agnes V. Edwards, 1200 East Clay St., Richmond, Secretary.

Wisconsin, State Medical Society of, Milwaukee, Sept. 13-15. Mr. Charles H. Crownhart, 110 East Main St., Madison, Secretary.

Current Medical Literature

AMERICAN

The Association library lends periodicals to members of the Association and to individual subscribers in continental United States and Canada for a period of three days. Three journals may be borrowed at a time. Periodicals are available from 1933 to date. Requests for issues of earlier date cannot be filled. Requests should be accompanied by stamps to cover postage (6 cents if one and 18 cents if three periodicals are requested). Periodicals published by the American Medical Association are not available for lending but can be supplied on purchase order. Reprints as a rule are the property of authors and can be obtained for permanent possession only from them.

Titles marked with an asterisk (*) are abstracted below.

American Journal of Public Health, New York

33:475-644 (May) 1943

Comparative Speed of Response of Previously Immunized and Non-immunized Children to Fluid and Alum Precipitated Diphtheria Toxoid. V. K. Volk, W. E. Bunney and J. T. Tripp.—p. 475.
Public Health Implications in City and Regional Planning. H. Bartholomew.—p. 481.
Small Outbreak of Smallpox in Detroit. F. H. Top and Laura E. Peck.—p. 490.
Integration of Medical Care into Health Program in Rural Missouri. J. W. Williams Jr.—p. 499.
Errors in Clinical Statements of Causes of Death: Second Report. K. Pohlen and H. Emerson.—p. 505.
Simplified Procedures in Tuberculosis Control. H. R. Edwards and A. B. Robins.—p. 517.
Accomplishments in Cerebral Fortification. R. C. Sherwood.—p. 526.
Association of Other Malignant Tumors with Cancer of Skin. H. L. Lombard and S. Warren.—p. 533.
Four Years' Use of Kahn Presumptive Test as Screening Agency in Serology of Syphilis. E. L. Webb and T. F. Sellers.—p. 537.
Postgraduate Education of Physicians for Industrial Health Service. C. M. Peterson.—p. 541.
Undergraduate Training of Industrial Hygiene Personnel. M. H. Kronenberg.—p. 545.
Comparative Study of Presumptive and Confirmative Media for Bacteria of Coliform Group and for Fecal Streptococci. A. A. Hajna and C. A. Perry.—p. 550.
Practical Housekeeping Program for Industry. H. G. Dyktor.—p. 557.
Typhoid Vaccine Studies: VII. Typhoid Paratyphoid Vaccine. D. Longfellow and G. F. Luippold.—p. 561.

American Review of Tuberculosis, New York

47:549-666 (June) 1943

*Twin Studies on Significance of Genetic Factors in Tuberculosis. F. J. Kallmann and D. Reisner.—p. 549.
Artificial Pneumothorax in Negroes: Evaluation of Results. R. Hoffman.—p. 575.
Laryngeal Tuberculosis in Negroes. D. F. Proctor.—p. 582.
Surgical Relief of Pain in Tuberculous Laryngitis. O. C. Brantigan and R. Hoffman.—p. 596.
Clinical Management of Intestinal Tuberculosis. W. M. Peck and Julia M. Jones.—p. 598.
Control of Tuberculosis in Leprosarium. G. H. Faget.—p. 603.
Practical Application of Bronchospirometry. J. D. Steele.—p. 608.
Early Primary Tuberculous Pulmonary Focus: About 4 to 8 Weeks Old. W. Pagel and Dorothy Stopford Price.—p. 614.
Promin in Experimental Tuberculosis in Guinea Pig. E. M. Medlar and K. T. Sasano.—p. 618.
*Demonstration of Tubercle Bacilli in Minimal Pulmonary Tuberculosis. W. P. Decker, W. H. Ordway and E. M. Medlar.—p. 625.
Mass Method for Concentrating and Staining Tubercle Bacilli. F. W. La Cava and Mary E. Ketchum.—p. 631.
Multiple Bacteriologic Etiology in Clinical Tuberculosis: Experimental Observations. H. A. Poindexter.—p. 635.
Blood Phosphatases and Acid Soluble Phosphorus in Experimental Tuberculosis. M. I. Smith and B. B. Westfall.—p. 647.
Sensitive Longevity-Immunity Test with Guinea Pigs. W. N. Berg.—p. 651.

Genetic Factors in Tuberculosis: Studies on Twins.—Kallmann and Reisner investigated the possible significance of genetic factors in the development of tuberculosis by means of the "twin family method." This method combines the technic of the original "twin method," that is, the comparison of unselected groups of one egg and two egg twin pairs with the principles of a family study including the other sibship groups as well as the marriage partners of the twins. The main objective of this procedure was to obtain for comparison a sufficient number of genetically dissimilar relationship groups reared under comparable environmental conditions. The study was organized with the cooperation of the tuberculosis hospitals and clinics in the state and city of New York, which reported a total number of 657 twin cases within a period of five years. The material used for analysis of the statistical data on manifest reinfection tuberculosis consists of 308 complete twin families with 616 twin partners, 930 full siblings, 74 half siblings, 688 parents and 226 marriage partners of twin patients. The random sampling of these 308 twin pairs is indicated by the proportion of 78 monozygotic to 230 dizygotic pairs, representing a ratio of about 1 : 3. Comparison of the corrected morbidity rates reveals that the chance of developing tuberculosis increases in proportion to the degree of blood relationship to a tuberculous index case. The difference in morbidity between dizygotic and monozygotic twin partners amounts to a ratio of 1 : 3.5, their corrected concordance rates being respectively 25.6 and 87.3 per cent. The difference between the dizygotic and monozygotic co-twins increases to a ratio of 1 : 16 if the similarities in extent, course and eventual outcome of the disease are taken as additional criteria of comparison. The differences in tuberculosis morbidity among the various sibship groups of the twin index cases cannot be adequately explained on the basis of a simple correlation between closeness of blood relationship and increasing similarity in environment with correspondingly intensified opportunity for infection. The analysis of the morbidity distribution in the sibship groups indicates that resistance to tuberculosis is modified by a heredoconstitutional mechanism which seems to be multifactorial in its genetic nature.

Demonstration of Tubercle Bacilli in Minimal Pulmonary Tuberculosis.—Decker and his associates insist that demonstration of tubercle bacilli is required to clinch the clinical diagnosis in minimal pulmonary tuberculosis. They present the results obtained with the intensive use of the more thorough laboratory methods. Repeated examinations of sputum and of fasting gastric contents by culture and guinea pig inoculation resulted in the demonstration of tubercle bacilli in 67 out of 97 patients with clinically active minimal pulmonary tuberculosis over a period of five years. In a previous five year period, when the more thorough laboratory methods were not in routine use, tubercle bacilli were demonstrated in only 24 of 172 cases. Gastric lavage studies gave positive results in 41 of 56 "no sputum" cases. Sputum smears were positive in but 16 of 269 cases. A high percentage of patients with clinically active minimal tuberculosis discharge tubercle bacilli. It is difficult to determine when patients with minimal disease are entirely free from bacilli. It is just as difficult to evaluate the significance of the discharge of a few bacilli on rare occasions.

Archives of Internal Medicine, Chicago

71:583-740 (May) 1943

Peripheral Vascular Response to Acute Anoxia. D. I. Abramson, H. Landt and J. E. Benjamin.—p. 583.
Hemorrhagic Lesions of Coronary Arteries. J. P. English and F. A. Willius.—p. 594.
Fibrosis of Endocardium and Myocardium with Mural Thrombosis: Notes on Its Relation to Isolated (Fiedler's) Myocarditis and to Beriberi Heart. J. J. Smith and J. Furth.—p. 602.
*Streptococcic Bacteremia Cured with Sulfadiazine: Report of Case of Infection Caused by Hemolytic Streptococci of Lancefield Group C, with Review of Literature and Presentation of Immunologic Data. W. M. M. Kirby and L. A. Rantz.—p. 620.
Primary and Secondary Hyperparathyroidism. L. J. Soffer and C. Cohn.—p. 630.
*Spontaneous Interstitial Emphysema of Lung: With Mediastinal, Retroperitoneal and Subcutaneous Emphysema. J. D. Adcock.—p. 650.
*Blue Scleras, Brittle Bones and Deafness: Report of Afflicted Family. J. E. Farber and A. E. Margulis.—p. 658.
Normal Cardiovascular Roentgen Silhouette: Studied by Means of Roentgenograms of Chests of Cadavers After Opaque Solutions Had Been Injected into Large Vessels and Chambers of Heart. J. M. Hoyos and J. J. Quesada.—p. 666.
Serum Concentration and Renal Clearance of Potassium in Severe Renal Insufficiency in Man. N. M. Keith, H. E. King and A. E. Osterberg.—p. 675.
*Adrenal Cortex in Systemic Disease: Morphologic Study. E. L. Sarason.—p. 702.
Diseases of Heart: Review of Significant Contributions Made During 1942. A. Graybiel, with editorial assistance of P. D. White.—p. 713.

Streptococcic Bacteria Cured with Sulfadiazine.—A man aged 65 for several months had been troubled with general fatigue, muscle aches and shortness of breath. He had suffered an attack of sharp, severe pain in the chest below the nipple on the left side. The pain radiated to both axillas and caused difficulty in breathing. He had one moderately severe chill.

Chilly sensations recurred at intervals. A superficial ulcer of the left thigh was noted on admission to the hospital. Small, pinkish red, maculopapular lesions were scattered over the entire body. There was a generalized reddening of the skin over parts of the trunk and extremities similar to a scarlet fever rash. Blood examination disclosed aplastic anemia, and the blood culture was positive for hemolytic streptococci, Lancefield group C. There was a rapid improvement following sulfadiazine therapy. The blood culture was negative for hemolytic streptococci on the third day of hospitalization. The cause of the aplastic anemia was not apparent but probably was not the streptococcic infection. The patient had had symptoms of the underlying disease for three months before chills and fever appeared, suggesting that the bacteremia was an intercurrent episode made possible by a lowering of the natural defense mechanism. The response to sulfadiazine was remarkable considering the age and the poor general state of the patient. The source of infection was probably the superficial ulcer on the left thigh. Group C organisms are occasionally isolated from human skin. The rash was of interest in view of the fact that scarlet fever has been known to have been caused by group C organisms. Immunologic studies in the reported case by Kirby and Rantz suggest that fibrinolysins and streptolysins O of groups A and C are similar if not identical. Since 95 per cent of infections with hemolytic streptococci in human beings are caused by organisms belonging to group A (Lancefield), the opinion has become generally accepted that members of the other groups are relatively avirulent. This point of view may have to be modified. Severe infections have been caused by members of groups other than A, chiefly by groups C and G, suggesting that the frequency of infections with organisms of the various groups may be partly a matter of distribution of the organisms rather than of virulence. Organisms belonging to groups A, C and G have certain characteristics in common which are different from those of members of the other groups. These three groups are the ones most commonly isolated in the order named in infections in human beings, and this may be in part due to their unique properties.

Spontaneous Interstitial Emphysema of Lung.—Hamman was first to report this condition in healthy persons without antecedent trauma or disease. The condition is largely dependent on the collection of air in the mediastinum. The onset is abrupt. The first symptom is a severe pain in the side of the chest or substernally. It may radiate to the neck or down the left arm closely mimicking the pain of coronary occlusion. The pathognomonic sign described by Hamman is a peculiar crackling, crunching sound heard over the sternum which is synchronous with the heart beat. There may or may not be signs of pneumothorax. A small amount of subcutaneous emphysema in the neck or thorax is sometimes present. Roentgenograms may or may not demonstrate the mediastinal air. The process has been benign in all instances, complete recovery occurring in several days. Adcock describes a case of spontaneous interstitial emphysema of the lung with extension of air into the retroperitoneal and subcutaneous tissues. The absence of pain in this case may have been due to the ease of escape of the air from the mediastinum which prevented the development of high mediastinal pressures. A small area of transient atelectasis was apparently responsible for the development of the interstitial emphysema of the lung. It was possible to locate clinically the site of escape of air from the alveoli into the perivascular and interstitial tissue of the lung. The auscultatory signs produced by air within the mediastinum differ in type and mode of production from the so-called pericardial knock sounds occasionally heard in left sided pneumothorax whether spontaneous or induced.

Blue Scleras, Brittle Bones and Deafness.—Farber and Margulis observed a family of 52 members, 12 of whom presented the syndrome of blue scleras. Seven of these have brittle bones, 4 are deaf and 1 has only blue scleras. Eight are males and 4 females. The condition is transmitted and occurs equally in the two sexes. The physical attributes of small stature, hypermobility of the joints, relaxation of the ligaments and abnormal shape of the head were found in the involved members. Three members of the group have been studied in detail. Roentgenograms of the skeleton revealed slender bones, generalized osteoporosis and deformities resulting from multiple fractures.

Adrenal Cortex in Systemic Disease.—Sarason attempted to establish correlations between changes in the morphologic aspects of the adrenal cortex and various systemic diseases. Adrenal glands were obtained from one hundred and ten routine autopsies performed at the New Haven Hospital one to six hours after death. No glands from persons with Addison's disease or primary neoplasm of the adrenal gland are contained in the series. Cortical enlargement associated with depletion of lipoid or reversal of lipoid pattern was found associated with inflammatory diseases, cachexia, pemphigus and protracted emesis. Cortical enlargement with an increased amount of lipoid was encountered in hypertension; the change was more striking when the hypertension was associated with primary vascular disease. The explanation of these changes is not at hand. No significant alterations were present in the series of cases of atherosclerosis. Extreme enlargement was found in 4 cases of erythroblastosis fetalis. This study emphasizes that enlargement of the adrenal cortex and depletion of lipoid are reflections of the metabolic disturbances associated with certain systemic diseases and not the direct effect of the latter.

Bulletin New York Academy of Medicine, New York

19:371-446 (June) 1943

Surgical Methods for Relief of Pain. F. C. Grant.—p. 373.
Effect of Vitamin E Therapy on Central Nervous System in Amyotrophic Lateral Sclerosis. C. Davison.—p. 386.
Treatment of Prostatic Carcinoma. B. S. Barringer.—p. 417.
Public Health in New York City: Retrospect. C. F. Bolduan.—p. 423.

California and Western Medicine, San Francisco

58:261-312 (May) 1943

Traumatic Shock and Hemorrhage. L. A. Alesen.—p. 265.
Dermatoses: Their Local Treatment with Sulfathiazole and Sulfadiazine. A. E. Ingels.—p. 269.
Aneurysm of Right Pulmonary Artery with Rupture into Bronchus and a Patent Ductus Arteriosus: Report of Case. A. S. Yuskis.—p. 272.
Nasal Allergy: Otolaryngologist's Problem in Relation to Southern California Districts. H. D. Smith, V. Goodhill and M. E. Webb.—p. 275.
Chemical Injuries of Eye: Their Treatment with Special Reference to War Gases. H. F. Whalman.—p. 279.

Canadian Medical Association Journal, Montreal

48:477-556 (June) 1943

*Survival of Preserved Erythrocytes After Transfusion. O. F. Denstedt, Dorothy E. Osborne, H. Stansfield and I. Rochlin.—p. 477.
Vole Acid Fast Bacillus Vaccination in Experimental Tuberculosis. D. Irwin and D. C. O'Connell.—p. 486.
The Diabetic. E. P. Joslin.—p. 488.
Allergic Problems. G. Chown.—p. 498.
Management of Vesical Neck Obstruction. N. E. Berry.—p. 501.
Retroperitoneal Tumors in Children. F. Pilcher.—p. 505.
Myasthenia Gravis. R. D. McKenna.—p. 510.
What Significance Has Uterine Retroversion? E. Shute.—p. 514.
Weather and the Patient's Skin. N. M. Wrong.—p. 520.
Nonmalignant Disease of Gallbladder and Bile Ducts. L. G. McCabe.—p. 522.

Preserved Erythrocytes After Transfusion.—The purpose of the studies reported by Denstedt and his collaborators was to determine the merits of two blood preservative mixtures, the one an unbuffered citrate-dextrose solution, the other buffered with phosphate at p_H 7.4. Both mixtures were isotonic with normal plasma. Blood can be stored in these solutions up to six weeks or two months at 4 C. with less than 1 per cent hemolysis. The buffered solution gives slightly better cell preservation during storage and favors less dense packing of cells on sedimentation. The survival of erythrocytes after transfusion was followed in 32 mental subjects by the MN method of Wiener. Specimens stored up to two months were used without any reaction. With regard to cell survival the buffered mixture did not exhibit special merit. The study indicates that cells stored up to eighteen days by either method survive as well as fresh cells after transfusion. Even with 25 or 30 day old blood, cell survival after transfusion is sufficiently high during the first three weeks to warrant the use of such specimens in the treatment of severe blood loss when fresher blood is not available. There is evidence that some

of the transfused cells may be stored instead of being destroyed and that they are released into the circulation again between the fifteenth and twenty-fifth days. A second and less decided rise in donor cell count often is observed about the sixtieth day.

Connecticut State Medical Journal, Hartford

7:293-380 (May) 1943

Investigation of Deaths in Interest of Public Safety. A. R. Moritz.—p. 310.
Medical Aspects of Obstetrics. W. W. Herrick.—p. 313.
Bureaucracy and Clinical Medicine. P. P. Swett.—p. 323.
Office Treatment of Mild Depression. Vera Mather Behrendt.—p. 324.

7:381-452 (June) 1943

International Control of Disease After War. Alice Hamilton.—p. 383.
Chemotherapy in Treatment of Obstetric and Gynecologic Urinary Tract Infections. R. G. Douglas.—p. 388.
Chemotherapy of Gastrointestinal Tract. L. M. Morrison.—p. 395.
Incidence of Pulmonary Tuberculosis in Bronchial Asthma. C. H. Sprague.—p. 399.
Clinical Significance of Bleeding During Second Half of Pregnancy. B. P. Watson.—p. 401.
Population of State Mental Hospitals in Connecticut. C. Barker, J. H. Watkins and I. V. Hiscock.—p. 406.
Use of Sulfanilamide in Appendical Peritonitis: With Report of 2 Cases Complicated by Anuria. N. R. Tolk and M. S. Popkin.—p. 408.
First Seventy-Five Years of Connecticut State Medical Society. C. Barker.—p. 410.

Delaware State Medical Journal, Wilmington

15:51-66 (April) 1943

Littré's Umbilical Hernia: Case Report. W. E. Bird.—p. 51.
The Doctor of Medicine and His Responsibility. A. W. Adson.—p. 58.

15:67-100 (May) 1943

How to Preserve Mental Health During Days of Unusual Stress. M. A. Tarumianz.—p. 67.
Psychoneurotic Reactions Resulting from Organic Disease. P. F. Elfeld.—p. 71.
Psychasthenia in Child of Seven Years. B. G. Lawrence.—p. 73.
Therapeutic Value of Pneumoencephalography in Post-Traumatic and Related Conditions. G. J. Gordon.—p. 74.
Mental Illness and Military Service. G. J. Gordon and M. Zimbler.—p. 77.
Alcohol and Subdural Hematoma. G. S. Bieringer.—p. 81.
Management of Psychotic Diabetics. F. A. Freyhan.—p. 84.
Psychologic Examination of Infants. J. Jastak.—p. 88.

Endocrinology, Springfield, Ill.

32:373-454 (May) 1943. **Partial Index**

Effect of High Protein Diets on Size and Activity of Adrenal Cortex in Albino Rat. J. Tepperman, F. L. Engel and C. N. H. Long.—p. 403.
Observations on Relationship of Thyroid to Polyuria of Experimental Diabetes Insipidus. C. E. Radcliffe.—p. 415.
Ovarian and Placental Function in Addison's Disease. L. T. Samuels, G. T. Evans and J. L. McKelvey.—p. 422.
Influence of Hyperthyroidism on Urinary Excretion of Thiamine and Riboflavin. B. Sure and Z. W. Ford Jr.—p. 433.

Gastroenterology, Baltimore

1:449-554 (May) 1943

Management of Ulcerative Colitis. J. A. Bargen.—p. 449.
*Whipple's Disease (Lipophagia Granulomatosis). F. L. Apperly and E. L. Copley.—p. 461.
Bacteriologic, Epidemiologic, Immunologic and Chemotherapeutic Aspects of Bacillary Dysentery. E. Neter.—p. 471.
New Test for Pancreatic Function: Experimental Observations. H. L. Popper and H. Necheles, with Assistance of W. H. Olson and M. Weiner.—p. 490.
Comparison of Insulin and Food as Stimuli for Differentiation of Vagal and Nonvagal Gastric Pouches. E. E. Jemerin, F. Hollander and V. A. Weinstein.—p. 500.
Effects of Some Intra-Abdominal Operative Procedures on Intestinal Activity: Experimental Study. K. G. Wakim and F. C. Mann.—p. 513.
Gastric Diverticula. M. L. Tracey.—p. 518.

Whipple's Disease (Lipophagia Granulomatosis).—Whipple in 1915 described a disease characterized anatomically by deposits of fat and fatty acids in the intestinal and mesenteric lymphatic tissues, which were greatly enlarged, the normal structure being replaced by dilated fat-filled lymphatic spaces and granulomatous tissue. The same or a similar condition has been described by others as intestinal lipodystrophy, lymphadenectasis, lymphadenocele, mesenteric chyladenectasis and lipophagia granulomatosis. Apperly and Copley report a case of lipophagia granulomatosis and compare it with 11 other cases. The disease appears in men aged 40 to 60 with indigestion, gaseous distention and often a history of polyarthritis. Later there is diarrhea or steatorrhea, often with blood, severe wasting and weight loss, moderate anemia and edema, low blood pressure, achlorhydria and often some skin pigmentation or icterus. Necropsy reveals filling of the intestinal mucosa with large fat filled foamy macrophages, greatly enlarged mesenteric lymph nodes composed of granulomatous tissue containing dilated lymphatics filled with lipid and surrounded by macrophages and giant cells, and often chylous ascites, moderate fibrous pleuritis, pericarditis and peritonitis.

Journal of Clin. Endocrinology, Springfield, Ill.

3:257-320 (May) 1943

Familial Eunuchoid Gigantism. K. Mansbacher.—p. 257.
Ectodermal Disorders in Chronic Hypoparathyroidism. N. Learner and C. L. Brown.—p. 261.
Congenital Myxedema Without Mental Retardation. J. C. Mussio Fournier and J. M. Cervino.—p. 265.
Therapy of Seminal Inadequacy: I. Use of Pituitary, Chorionic and Equine Gonadotropins. C. D. Davis, R. L. Pullen, J. H. M. Madden and E. C. Hamblen.—p. 268.
Physiology of Endocrines in Pregnancy, Lactation and Puerperium. E. Novak.—p. 274.
Endocrine Tumors of Ovary. S. H. Geist and F. Spielman.—p. 281.
Psychology of Menstrual Cycle. S. Rosenzweig.—p. 296.

Journal Industrial Hygiene & Toxicology, Baltimore

25:175-196 (May) 1943

Chronic Toxicity of Aerosol-OT. A. E. Benaglia, E. J. Robinson, E. Utley and M. A. Cleverdon.—p. 175.
Determination of Halogenated Hydrocarbons in Atmosphere. F. H. Goldman and C. G. Seegmiller.—p. 181.
Filter Paper Method for Lead Fume Collection. L. Silverman and J. F. Ege Jr.—p. 185.
*Plumbism Resulting from Oxyacetylene Cutting of Painted Structural Steel. I. R. Tabershaw, B. P. W. Ruotolo and R. P. Gleason.—p. 189.
Observations on Fate of Pentachlorophenol in Animal Organism. W. Machle, W. Deichmann and G. Thomas.—p. 192.
Estimation of Minute Amounts of Tetryl in Atmosphere. F. H. Goldman and D. E. Rushing.—p. 195.

Plumbism Resulting from Cutting Painted Steel.—Tabershaw and his associates point out that the discovery of several cases of lead poisoning in a group of oxyacetylene burners engaged in cutting painted steel has brought attention once more to a hazard which was extremely common during and after the first world war. The report concerns 14 men engaged in salvaging an old elevated railway structure. All the workers except two were supplied with mechanical filter respirators approved by the Bureau of Mines for use against toxic metal fumes. The filters were changed daily. Two men were supplied with canister type respirators containing a felt filter and a charcoal soda-lime mixture for the removal of acid gases and vapors. In the course of the salvage operation practically all the men were ill at one time or another with some slight or major symptoms of lead poisoning. The authors present two typical histories. The evidence is overwhelming that the cutting of structural steel covered with lead bearing paint is a potential source of plumbism and that neither the use of respirators nor natural ventilation provides complete protection. Nevertheless the wearing of approved respirators should be insisted on during the entire work period. Medical examinations should be done periodically, including blood and urine studies. Workers who develop signs or symptoms of plumbism should be transferred to jobs which do not present the same hazard. At present there is a great deal of oxyacetylene cutting being done in the repair of damaged ships. Burners cut painted steel to suitable size and shape. There can be no doubt that the workers are exposed to a serious lead hazard.

Kansas Medical Society Journal, Topeka

44:109-144 (April) 1943

Fundamentals of Psychiatry: VII. Oedipus and Castration Conflicts. W. C. Menninger.—p. 109.
Doctor of Medicine and His Responsibility. A. W. Adson.—p. 111.

44:145-180 (May) 1943

Infectious Mononucleosis from Clinical Standpoint. H. W. Day.—p. 148.
Fundamentals of Psychiatry: VIII. Object Finding Phases of Development. W. C. Menninger.—p. 151.
Active Serum Complement Fixation: Description and Results of Simple Method. M. Gerundo.—p. 153.

Military Surgeon, Washington, D. C.

92:583-690 (June) 1943

Medicine Goes to War Again. H. W. Jones.—p. 583.
Guide for Standing Operating Procedure for Medical Battalion—Infantry Division. H. P. Carter.—p. 597.
Working Concept of Morale for Flight Surgeons. A. H. Leighton.—p. 601.
New Multi Purpose War Dressing. J. L. Gallagher.—p. 609.
Maintaining Quality of Nursing Service in Emergency. Clare Dennison.—p. 617.
Colonel Bushnell's Epidemiology of Tuberculosis. J. W. Turner.—p. 626.
Acrylic Jacket Crown as Abutment for Fixed Bridge. F. W. Stevens.—p. 639.
Dental Field Case. R. N. MacMillan.—p. 643.
Rectus Muscle Strain Simulating Acute Appendicitis. W. F. Bowers and N. F. Richard.—p. 645.
Internal Derangement of Knee Joint. G. D. Caldwell.—p. 648.
Modified Calibrated Skin Grafting Knife. K. M. Marcks.—p. 653.
Malingering Among Soldiers: Orthopedic Aspects. L. N. Cozen.—p. 655.

Missouri State Medical Assn. Journal, St. Louis

40:133-160 (May) 1943

Essential Factors in Partial Gastrectomy for Gastric and Duodenal Lesions. C. J. Hunt and P. F. Hunt.—p. 133.
Outbreak of Staphylococcus Food Poisoning. J. E. Smith and N. Nagle.—p. 135.
Acute Appendicitis: Management of Rupture with Spreading Peritonitis. G. R. Presnell.—p. 137.

40:161-190 (June) 1943

Treatment of Tumors by Escharotics. L. V. Ackerman and T. P. Eberhard.—p. 163.
Rocky Mountain Spotted Fever in Midwest. E. B. Smith and E. H. Reinhard.—p. 166.
Rocky Mountain Spotted Fever: Report of 2 Cases. R. S. Casford.—p. 171.
Fibroma of Stomach: Case Report. H. M. Wiley.—p. 171.

New England Journal of Medicine, Boston

22.:559-594 (May 6) 1943

Spina Bifida and Cranium Bifidum: I. Survey of 546 Cases. F. D. Ingraham.—p. 559.
Spasmodic Rectal Pain: Review of Literature and Report of Case. H. L. Bolen.—p. 564.
Acute Hemolytic Anemia Following Sulfadiazine: Report of Case. N. H. Boyer.—p. 566.

228:595-630 (May 13) 1943

Psychiatry in New Hampshire: First Hundred Years. S. Stone.—p. 595.
Medical Management of Intestinal Obstruction: With Special Reference to Use of Miller-Abbott Tube. J. H. Folley.—p. 606.

228:631-666 (May 20) 1943

Spina Bifida and Cranium Bifidum: II. Surgical Treatment. F. D. Ingraham and H. Hamlin.—p. 631.
*Isoimmunization with Rh Factor in Acquired Hemolytic Anemia: Report of Case. W. Dameshek and P. Levine.—p. 641.

228:667-698 (May 27) 1943

Small Puddles. E. P. Bagg.—p. 667.
Practical Considerations in Therapeutic Use of Blood Derivatives. L. R. Newhouser and E. L. Lozner.—p. 671.
Biopsy of Prostate with Silverman Needle. E. L. Peirson and D. A. Nickerson.—p. 675.
Skin Changes of Nutritional Origin. H. Jeghers.—p. 678.

Isoimmunization with Rh Factor.—Dameshek and Levine report that a patient with subacute acquired hemolytic anemia developed severe and almost fatal hemolytic reactions when given successive blood transfusions. Subsequent testing revealed that the patient (group O, Rh—) had developed isoimmunization to the Rh factor with the presence in the blood of both a warm anti Rh agglutinin and a cold agglutinin. Transfusions with Rh— blood were without reaction. Splenectomy and biopsy of the liver showed intense myeloid metaplasia of both organs. Death resulted from acute toxic necrosis of the liver. Necropsy revealed widespread myeloid metaplasia in the presence of severe hemolysis. Repeated transfusions in acute hemolytic anemia may be followed by isoimmunization and the development of irreversible hemolysis. As the result splenectomy, which might originally have been curative, may prove ineffective.

Ohio State Medical Journal, Columbus

39:505-608 (June) 1943

Preventive Medicine in Industry. J. H. Foulger.—p. 521.
Present Day Influences in Industrial Health. C. Leggo.—p. 526.
Physical Therapy in Relation to General Practice. F. H. Krusen.—p. 530.
Essentials and Organizations of Industrial Health Services. C. M. Peterson.—p. 543.
Women in Industry: Present and Future Problems. H. C. Hesseltine.—p. 545.
Myasthenia Gravis with Profound Muscle Atrophy: Case Record Presenting Clinical Problems. C. D. Aring and M. Scheinker.—p. 550.
Importance in Nutrition of Manganese. J. Forman.—p. 553.
Early Surgery in Ohio. D. W. Palmer.—p. 556.

Pennsylvania Medical Journal, Harrisburg

46:785-880 (May) 1943

Neoplasms of Ovary. J. V. Meigs.—p. 797.
Clinical and Pathologic Aspects of Certain "Hormone Producing" Tumors. S. P. Reimann and E. B. Keller Jr.—p. 805.
Coronary Artery Occlusion in Bacterial Endocarditis: Case Report. P. S. Caplan and A. N. Alpern.—p. 809.
Incidence of Dysphagia from Intrathoracic Extraesophageal Tumors. H. N. Hill and P. P. Vinson.—p. 814.
Importance of Allergy in Practice of Pediatrics. L. H. Criep.—p. 816.
Surgical Treatment of Cancer of Larynx. C. L. Jackson and C. M. Norris.—p. 822.
Psychologic Management of Patient with Cardiac Disase. C. E. Ervin.—p. 829.
Differential Diagnosis of Precordial Pain. H. G. Schleiter.—p. 832.

Public Health Reports, Washington, D. C.

58:757-792 (May 14) 1943

*Rocky Mountain Spotted Fever: Further Experience in Therapeutic Use of Immune Rabbit Serum. N. H. Topping.—p. 757.
Improved Antigen for Complement Fixation in American Trypanosomiasis. D. J. Davis.—p. 775.

58:793-824 (May 21) 1943

National, Provincial and Local Nutrition Programs in Canada. G. F. Amyot.—p. 793.
Cooperative Nutrition Program in North Carolina. J. F. Kendrick.—p. 797.
Role of Health Department in National Nutrition Program. W. H. Sebrell and W. Wilkins.—p. 803.

Immune Rabbit Serum in Rocky Mountain Spotted Fever.—Topping reports his experience with immune rabbit serum in the treatment of laboratory animals infected with the virus of Rocky Mountain spotted fever. The serums used were from two sources and differed only in the antigen used for the active immunization of the rabbits. The methods of concentration and purification were identical. The T serum was prepared with tick antigen and the L serum by the use of infected yolk sac material. The experiments indicate that it is possible to produce an immune serum in rabbits by the use of live virus either from infected ticks or from infected yolk sacs. Administration of this serum to infected guinea pigs and monkeys demonstrated its therapeutic value when given early. With small doses the therapeutic effect varied inversely with elapsed time from the inoculation of the infecting dose to the administration of the serum. If given within twenty-four hours after infection it would completely suppress the disease. If a small dose was given from forty-eight to seventy-two hours after the infection it would modify the disease in such a manner as to prevent death as well as the scrotal reaction of spotted fever in guinea-pigs. This small dose was of no value after seventy-two hours, but, if the dose was increased, benefit could be demonstrated as late as one hundred and twenty hours after infection (the second day of fever). The results of the human trial are not conclusive because of the small number of cases. The fatality rate in cases treated before the third day of rash was considerably below that expected from past experience with patients receiving no serum. There were only two deaths in the 52 cases treated. Of the 52 patients treated only 2 died, both of whom were men aged 66 and 72 respectively, or a fatality rate of 3.8 per cent, as compared to the expected rate of approximately 18.8 per cent. Anti-Rocky Mountain spotted fever serum should be considered as offering hope in the treatment of this disease.

FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

Lancet, London

1:669-698 (May 29) 1943

Forces Behind Specialism in Surgery. V. Bonney.—p. 669.
Vital Statistics of 1942. P. Stocks.—p. 672.
*Infective Hepatitis: 300 Cases in an Outer London Borough. J. C. Ford.—p. 675.
*Jaundice Following Yellow Fever Immunization: Transmission by Intranasal Instillation. G. M. Findlay and N. H. Martin.—p. 678.
*Treatment of Immersion Foot by Dry Cooling. C. C. Ungley.—p. 681.

Infective Hepatitis.—Ford reviews 300 cases of infective hepatitis which occurred in Wembley, an outer London borough. These 300 cases form part of a larger outbreak extending over surrounding districts. The only death among them was that of a boy aged 16, who was hospitalized in coma and died of hepatic failure three days later. Water, milk or foods could not be suspected as sources of infection nor could the infection have been spread by rodents. With few exceptions the patients all reported known close contact with other persons who either were suffering from the disease or had just recovered. Most patients showed well defined prodromal symptoms such as mental depression, irritability or drowsiness, with loss of appetite and constipation often accompanied by headache, with pain in the right epigastrium, sometimes diagnosed as acute appendicitis. Many patients complained of shivering attacks, and a few of muscular tenderness or photophobia. After three or four days, nausea and vomiting appeared and there was a rise of temperature. Bile in the urine appeared on the fifth or sixth day of the illness and was followed in twenty-four to forty-eight hours by jaundice. The jaundice commenced always in the ocular conjunctivas and often spread to the face, neck, abdomen and the whole body. With the onset of jaundice there was in most cases a remarkable improvement in the patient's general condition. The liver was found to be moderately enlarged but the spleen could not be felt. Many patients lost several pounds. The jaundice usually cleared within one to three weeks. Confinement to bed for a few days with restriction of fats and increase of carbohydrates were effective measures. Calomel was a useful purgative. Both home and school contact could be blamed for the spread of infection. As the infective agent has not been isolated and as it appears that the incubation period is long, the only suggestion put forward for the control of the infection is that, during an epidemic, children who vomit in school should be excluded for seven days.

Transmission of Jaundice Following Yellow Fever Immunization by Intranasal Instillation.—Findlay and Martin point out that in 1937 attention was called to the occurrence of jaundice following yellow fever immunization. Evidence was brought forward to show that this jaundice had nothing to do with the yellow fever virus as such but was probably due to some agent in the human serum used in the preparation of the vaccine. It was considered possible that this icterogenic agent had multiplied, together with the virus of yellow fever, in a serum-Tyrode culture medium containing minced chick embryo. When the technic of preparing the vaccine was altered by employing only serum taken from donors who had remained in perfect health for a month or more after the serum had been withdrawn, and by inactivating the serum for at least thirty minutes at 56 C., no further cases of post-inoculation jaundice occurred in the many thousands of persons immunized in England and Africa from November 1937 onward. Similar precautions taken in Brazil also resulted in the elimination of jaundice as a sequel to yellow fever immunization. Recently jaundice has been reported among American army personnel inoculated with yellow fever vaccine, and within the last few months between 250 and 300 cases of jaundice have again been seen following yellow fever immunization in Britain. All attempts to transmit the disease to the usual laboratory animals having failed, it was determined to investigate the possibility of transmission to human beings. Four men volunteered. They had never suffered from jaundice. All were immune to yellow fever, having been immunized eight months previously from a batch of vaccine that had not produced jaundice in any person. Washings were obtained from the nasopharynx of patients with icteric or preicteric symptoms following yellow fever inoculation. For instillation into the nares the volunteers were placed flat on a couch with the head hanging over one end. The nasal washings were then slowly dropped into the nostrils of the volunteers, who were told to sniff. Of the 4 volunteers 1 has shown no evidence of illness. There is doubt whether the patient with whose nasal washings he was inoculated ever suffered from postinoculation jaundice. Of the 3 others, 1 had subclinical icterus associated with mild symptoms. Two, however, suffered from jaundice. The results so far obtained with jaundice following yellow fever immunization show that in the nasal washings from patients in the preicteric and possibly icteric stage there exists an agent which is capable of inducing jaundice in human volunteers with symptoms similar to those of infective hepatitis after an incubation period varying from thirty to fifty days.

Treatment of Immersion Foot by Dry Cooling.—Ungley describes the methods employed by Webster and his colleagues in treating cases of immersion foot in the hyperemic stage by dry cooling: (*a*) Dry ice bags were placed round each foot and changed every four hours or oftener if necessary, to reduce skin temperature by about 6 degrees C.; (*b*) the feet were fanned with air cooled by cold water sprayed from a nebulizer; (*c*) the feet were exposed to room temperature in a cool ward. Pains were relieved and the patients were comfortable within four hours. Edema usually subsided rapidly and contents of blebs were absorbed. In several cases impending gangrene was arrested. Ungley had an opportunity to try methods of dry cooling in immersion foot in the hyperemic stage. Two men were rescued after exposure for thirty-four hours on a raft in the North Sea, reaching the hospital a few hours later. Their feet were cold, blue and moderately swollen. During the night the feet became hot (32 to 34.5 C., or 89.6 to 94.1 F.) and more swollen. Ungley's experience in these cases confirms Webster's observation that cooling the hot limbs relieves pain and tingling. Exposure of the feet to a cool room temperature (15 to 18 C., or 59 to 64.4 F.) with a fan playing on the soles proved a simple and satisfactory method. It was not found necessary to spray cold water through the fan or to use icebags. The speed and distance of the fan were adjusted to maintain skin temperatures of from 23 to 26 C. (73.4 to 78.8 F.); cooling to less than 21 C. (69.8 F.) gave rise to discomfort. The author thinks that for severe cases requiring long, uninterrupted cooling and not intolerant to restriction of leg movements, Greene's therapeutic refrigerator might prove useful.

Quarterly Journal of Medicine, Oxford

12:101-140 (April) 1943

*Familial Hemolytic Anemia (Acholuric Jaundice), with Particular Reference to Changes in Fragility Produced by Splenectomy. J. V. Dacie.—p. 101.
*Tonsil Adenoid Operation in Relation to Health of Group of Schoolgirls. J. H. P. Paton.—p. 119.
Galactose Tolerance Tests in Thyrotoxicosis. C. G. Barnes and E. J. King.—p. 129.

Familial Hemolytic Anemia and Splenectomy.—Dacie studied erythrocyte fragility to hypotonic saline solution in 24 cases of familial hemolytic anemia. Three main types of quantitative fragility curves could be distinguished—"tailed" curves (12 cases), "diagonal" curves (6 cases) and "normal type" curves (5 cases). Splenectomy was performed in 12 cases, in 11 of which resistance to hemolysis was increased after operation. In 7 cases with "tailed" curves increasing in resistance was preceded by a transient postoperative increase in fragility. In 1 case, first seen in a hemolytic crisis, fragility ultimately became normal; in another there was an increase in fragility compared with the preoperative level, which persisted for at least three years after splenectomy. Great engorgement with blood was the most notable feature of the 12 examined spleens. Perfusion experiments with excised spleens failed to demonstrate the cause of the congestion. Although it was difficult to free the pulp from blood by perfusion with saline solution, the

time of circulation of test objects (fowl erythrocytes) through the spleens appeared normal. The various theories on the pathogenesis of the disease are considered. The available evidence suggests a hemolytic disorder based on the presence of erythrocytes with an increased tendency to hemolysis. Although there is much evidence to support the view that this represents a primary defect in erythropoiesis, experimental and clinical observations on the relationship between hemolytic anemia, splenic congestion and spherocytosis indicate that the possibility of the presence of an abnormal hemolytic agent or metabolite cannot be ignored.

Tonsil Adenoid Operation and Health of School Girls.—Paton analyzes the records of 909 girls admitted to a boarding school between 1930 and 1939. The girls are recruited from well to do families and are healthy on admission. The majority enter school at or about puberty. The data are extracted from the history and state of health on examination recorded at entry and the records of illness during the school years. Fifty-seven per cent of the girls had had their tonsils removed and 50 per cent had had their adenoids removed. Inquiry into the incidence of illness among 909 girls revealed that the operation group was no healthier than the control group on arrival at school. The operation group was less healthy than the control group while at school. This is shown by the number of school days lost through illness. The operation group suffered less from tonsillitis. The operation group suffered much more from respiratory infections and lost more days from bronchitis alone than they gained in respect of tonsillitis. When the small groups in whom a single operation was performed (tonsil operation 57 cases, adenoid operation 24 cases) are considered, certain deductions are warranted. Removal of the tonsils is the factor in the combined operation responsible for the reduction in tonsillitis and for the increase in respiratory infections. Adenoidectomy alone reduces the liability to respiratory infections, but in the combined operation group the removal of adenoids failed to counteract the increase in respiratory infections which resulted from the tonsillectomy. Removal of adenoids increases the liability to acute otorrhea. Recurrent attacks of otorrhea are seldom prevented and primary attacks of otorrhea are more frequent after the operation. These figures support the conclusion of Glover and Wilson, arrived at from a survey of more than fourteen thousand records, that a large proportion of the tonsil and adenoid operations now done on children are "unnecessary, entail some risk and give little or no return."

Revista de la Asoc. Méd. Argentina, Buenos Aires

57:81-148 (March 15-30) 1943. **Partial Index**

Tumor of Carotid Corpuscle: Case. C. I. Rivas and T. J. Oñate.—p. 91.
Dystocia Due to Neuroma Previo: Case. C. J. Duverges.—p. 94.
*Hashimoto's Disease (Lymphoid Goiter): Case. S. E. Luchetti and M. Polak.—p. 107.

Hashimoto's Disease.—Lymphoid goiter is observed in women past 40 years of age. The condition develops slowly, is woody hard on palpation and involves all of the gland. The gland is not adherent to the neighboring tissue. Hypothyroidism is the result. The diagnosis is confirmed by the microscopic examination of tissue removed at the operation. The therapy consists in bilateral subtotal thyroidectomy. Postoperative myxedema is a frequent complication but is readily controlled by administration of thyroid preparations.

Semana Médica, Buenos Aires

50:525-580 (March 11) 1943. **Partial Index**

Syndrome of Chronic Cardiac Compression. A. Yódice.—p. 525.
*Bismuth in Poliomyelitis: Salts of Heavy Metals in Diseases Caused by Neurotropic Virus. A. Calabrese.—p. 531.
Prostatectomy in One Stage with Perineal Drainage. J. Toro.—p. 542.
Analgesia by Means of Gases in Obstetric Practice. I. Nunziata.—p. 554.

Bismuth Compounds in Poliomyelitis.—Calabrese used bismuth compounds in the treatment of 58 cases of poliomyelitis with encouraging results. The treatment should be begun early and saturation accomplished as quickly as possible. The author uses hydrosoluble as well as liposoluble bismuth. The hydrosoluble substance is administered in doses of from 3 to 4 mg. per kilogram of body weight. This dose is usually given by intramuscular injection and is repeated after twelve hours, because the hydrosoluble substance is rapidly eliminated (in about twenty-four hours). The liposoluble product is given simultaneously and also by intramuscular injection but in smaller doses (1 to 2 mg. per kilogram of body weight) and on alternate days. The liposoluble bismuth exerts a sort of depot action. During the subacute stage only the liposoluble substance is given every other day or every third day. The toxicity is slight; gingivitis was observed in some cases, but it disappeared rapidly after lavage with sodium bicarbonate. Vitamin B can be given in addition to the bismuth, and the symptomatic treatment should be maintained.

Deutsche medizinische Wochenschrift, Leipzig

68:157-184 (Feb. 13) 1942. **Partial Index**

Iron Metabolism and Iron Therapy from Standpoint of Internal Medicine. W. Schultz.—p. 157.
Importance of Iron Metabolism for Therapy. H. Albers.—p. 160.
*Sublingual Application of Desoxycorticosterone in Addison's Disease. F. Heni.—p. 162.
Writing Test in Occupational Mercury Poisoning. E. Holstein.—p. 170.

Sublingual Application of Desoxycorticosterone.—Heni reports 3 cases of Addison's disease in which he resorted to the sublingual administration of desoxycorticosterone. He gave the substance in the form of drops as well as in the form of tablets to be dissolved under the tongue. His experience with this method of administration corroborated the report of American authors (Anderson and others) that the sublingual application of desoxycorticosterone acetate can be employed with good results. The absorption through the lingual and oral mucosa is good but is only three fourths that absorbed from intramuscular injection. For this reason the dose must be about one third higher. Gastrointestinal disturbances developed in 1 of the patients, but these were partly due to excessive dosage. The sublingual administration can replace the intramuscular injection as well as the subcutaneous implantation of crystalline substance in the continued treatment of Addison's disease.

Klinische Wochenschrift, Berlin

21:169-192 (Feb. 21) 1942. **Partial Index**

Thyrotoxic Gastric Crises. H. Curschmann.—p. 175.
Modification of Moers-Schlienz Method of Blood Pressure Determination in Experimental Animals. H. Johner and M. Gukelberger.—p. 176.
*Studies on Bomskov's Thymus Hormone with Especial Consideration of Status Thymicolymphaticus. J. Rechenberger, H. Güthert and E. Schairer.—p. 177.
Role of Position of Electric Axis in Localization of Myocardial Lesions. L. Unghváry.—p. 181.
*Attempts to Treat Typhus with Sulfapyridine. W. Menk.—p. 185.

Bomskov's Thymus Hormone and Status Thymicolymphaticus.—Rechenberger and his associates extracted the thymus hormone according to Bomskov's method from the thymus glands of children who died in status thymicolymphaticus. They tested its effect on the hepatic glycogen of rats and guinea pigs and found it to be indefinite. Thymus hormone was also extracted from calf thymus according either to Bomskov's or to other methods of extraction. The hormone obtained from calves showed no definite action on the hepatic glycogen of test animals. Raw thymus oil obtained from Bomskov himself produced the same results. The glycogen content of the livers of children who died suddenly in status thymicolymphaticus was within normal limits.

Sulfapyridine in Typhus.—Menk gave sulfapyridine to patients with typhus in Poland in 1940 chiefly to combat the complicating pneumonias. His observations and those of others seemed to indicate that sulfapyridine was effective for that purpose. The effect on the typhus itself was negative. Animal experiments do not make it probable that sulfapyridine will be effective in human typhus. Tests with numerous sulfonamide compounds revealed only one preparation that had some effect on the Rickettsia mooseri infection of mice.

Book Notices

Operative Oral Surgery. By Leo Winter, D.D.S., M.D., F.A.C.D., Professor of Oral Surgery, New York University, New York. Second edition. Fabrikoid. Price, $12.50. Pp. 1,074, with 1,211 illustrations. St. Louis: C. V. Mosby Company, 1943.

In the war emergency Dr. Leo Winter felt it imperative to revise the former edition to include important discoveries and developments in the practice of oral surgery. Many dental surgeons will be called on to provide first treatment to a large number of war casualties which differ but slightly from traumatic wounds occurring in civil life in these days of too frequent automobile accidents. At the battle front the armamentarium for proper treatment is not always at hand; therefore Dr. Winter has presented the simplest and most expedient methods of treatment to bring the desired results.

Amplifications cover chemotherapy, shocks, burns, war wounds, dislocation and subluxation of the temporomandibular articulation, pin fixation or skeletal fixation for treatment of fractures, general anesthesia and oral manifestations of blood dyscrasias. A foreword gives a warning to the student of oral surgery of the necessity of a complete knowledge of anatomy and physiology. He should be able to visualize the parts as clearly as if the coverings of the jaws were transparent. The skilful oral surgeon has accurate knowledge of the jaws, sinuses and structures in the floor of the mouth and neck and their mutual relations.

Various methods of local anesthesia and their technic are described in detail, with colored illustrations to show nerves, arteries and veins, to locate the point of puncture. When a general anesthetic is required, inhalation anesthesia is today the principal medium for control of pain. Minimizing the dangers to the patient is of serious importance. Respiratory obstruction must be carefully watched during oral surgery, as it may result, in the upper air passages, from anatomic distortions, operators' instruments, packs or hands, laryngospasm and from anesthetic appliances. Lower respiratory obstruction may be caused by aspiration of blood or secretions. A special anesthetist is required by the oral surgeon so that he may concentrate on surgery without the responsibility of watching the effect of the anesthetic on the patient. Special consideration should be given to the type of anesthetic to fit the idiosyncrasies of the patient. In emergencies the anesthesia problem has to be met with the most expedient method that the conditions and supplies permit.

In exodontia special consideration is given to roots in antrums and impacted teeth. In pericoronitis x-ray films are useless in diagnosis but valuable in deciding the technic to be employed when the removal of the tooth is indicated. Pain and its manifestations in various neuralgias are described and differentiated. The pain in tic douloureux is the most severe and surgery the only cure. It definitely is not of dental origin. Swellings of the face and neck present a diagnostic problem, as they may be of dental origin or a definite manifestation of diseases which must be correctly determined and properly treated. Blood dyscrasias are often first manifested in the mouth and recognized by the oral surgeon. A brief outline gives "the major features of the various hematologic and related conditions which may be associated with oral manifestations."

Differentiation between adamantinomas and cysts is of utmost importance, as it is essential to resort to proper treatment at the outset. Clinical diagnosis should be supplemented by x-ray examination and a biopsy, which will be the determining factor. Periodic x-ray examination of the teeth and systematic clinical examination of the mouth are safeguards against any abnormalities developing to a stage requiring mutilating surgery.

Dental prosthesis sometimes requires oral surgery in preparation for correction of the bone structure and tissue formation in the mouth to obtain perfect fitting dentures. When treatment and occlusal adjustment fail to clear up pyorrhea pockets the dentist must resort to surgery, using either the so-called flap operation or gingivectomy. Fractures are usually caused by some form of trauma, but there are also systemic causes which must be considered. The history, followed by careful examination, will reveal symptoms of diagnostic significance. Then the best method for immobilization of the part may be determined. Loss of a segment of bone from osteomyelitis, removal of a malignant growth or a certain type of injury may require a bone graft, which must be esthetically and functionally correct to reconstruct the lost part.

In the chapter on chemotherapy the clinical action of sulfanilamide on various types of organisms is presented with its relative merits. In oral surgery sulfathiazole has surpassed sulfanilamide for treatment of infectious processes because of the reduced toxicity of sulfathiazole. "In the treatment of war wounds in the soft tissues of the face, observations of surgeons are that sulfanilamide is superior to sulfathiazole in bacteriostatic activity."

The same problems present themselves in the case of wounds whether they occur in civil or in military life. "The factors of respiration, shock, hemorrhage, fracture, infection, foreign bodies and transportation of the individual are always prevalent." Respiration should be watched to make sure there is no obstruction, treatment for shock should be given before its onset rather than after, and the control of bleeding is vital for the maintenance of life. After treatment of the wound and removal of foreign bodies, where it is advisable, the maintenance of space is important for future surgical consideration. "The future success of plastic surgery will depend upon the wisdom and ingenuity of the oral surgeon in the immediate treatment." When the features have completely collapsed as a result of loss of bony substance, it becomes an impossibility for the plastic surgeon to recreate the individual part. Orthodontic and prosthetic appliances should be employed to prevent the collapse of bony fragments.

Surgical treatment of prognathous mandibles is an interesting study. Shortening of the mandible may be accomplished in a relatively short time and harmony in relative size of the mandible to the maxilla may be produced with satisfactory functional and esthetic results. Conversely, in underdevelopment of the mandible it may be extended to a proper relationship between the two jaws. Every operative procedure is so carefully illustrated step by step that this book might be classed as visual education.

Doctor in the Making: The Art of Being a Medical Student. By Arthur W. Ham, M.B., Associate Professor of Anatomy, in Charge of Histology, Faculty of Medicine, University of Toronto, Toronto, Ontario, and M. D. Salter, M.A., Ph.D. Cloth. Price, $2. Pp. 179, with illustrations by Jean McConnell. Philadelphia, Montreal & London: J. B. Lippincott Company, 1943.

Here is an engagingly written and amusingly illustrated little book which fulfils the promise of the preface that "It deals with the motives and mental equipment that are necessary if one is to be a successful medical student and—with the common enemies of success." It contains many valuable hints and guides for the student in any field but especially for the high school and college student who is looking toward medicine as a career, as well as for medical students, for whom it "is designed primarily." For those members of the faculty also who lack adequate insight into the motivations and difficulties of the present day medical student in adjusting himself to the increased scope and greatly expanded content of the medical course, the book is especially recommended.

The authors have written from their rich experience at the University of Toronto as faculty advisers of medical students. The fact that "ability and academic preparation" do not guarantee success unless "habits of study, attitudes, general personality characteristics and other factors" properly condition the student for his life of study is the ripe fruit of their experience (as it has been of others) and the well illustrated theme of this book.

The book is more than a helpful guide to the poorly adjusted or bewildered student; it is also an excellent medicopsychologic analysis of personality and character in terms of the essential elements which determine the conditions for success in life. The chapter, for example, on the "child self" as a handicap to success in adult life is a condensed course in psychobiology which if adequately digested will lead to greater self understanding and insight. That this is essential for any one who hopes to be an understanding and respected physician

—and incidentally a successful one—is the secondary, if unexpressed, theme of the book. This is an effort on the part of the authors to cure the student of incipient and actual maladjustments through the process of education as a first step in practicing the aphorism "Doctor, cure thyself" if he is to realize the full responsibilities and greatness of a physician. The chapter on "Understanding and Applying the Scientific Method" is a further analysis of scientific thinking as contrasted with delusional thinking. The student who understands this chapter is well equipped to guard himself against the pitfalls of rationalization and deduction so often the cause of faulty reasoning and diagnosis.

Finally under the title of "Do's and Don'ts for the Student" it is pointed out that the "medical student automatically assumes some of the responsibilities of the profession." This chapter is a fitting conclusion for it emphasizes the human values in the culture of medicine, a culture which studies man in all of his multifold activities and at all levels of his existence. The authors think that "in general the average medical student or physician does not appreciate the cultural value of his knowledge and the great need for him to use this knowledge as a leaven for community opinion." The old fashioned country doctor "was not afraid to let the weight of his opinion be felt in community life, and he was not infrequently the greatest stabilizing force in a community." The authors rightly raise the question whether the present day graduate exerts the same desirable beneficent influence in the modern urban industrial community of which his highly specialized functions are a part.

Doctor in the Making is a valuable contribution not least because of its challenge to greatness in the physician of tomorrow.

Physiological Principles in Treatment. By Sir Walter Langdon-Brown, M.A., M.D., Hon. D.Sc., Consulting Physician to St. Bartholomew's and the Metropolitan Hospitals, London, and Reginald Hilton, M.A., M.D., F.R.C.P., Physician to St. Thomas's Hospital, London. Eighth edition. Cloth. Price, $3.50. Pp. 323, with 4 illustrations. Baltimore: William Wood & Company, 1943.

The fact that this book has gone into the eighth edition would lead one to believe that it must be exceedingly valuable. Actually, after dipping into the text one wonders if the main reason the book has sold so well is that so many physicians are hungry for knowledge about modern physiologic principles in treatment. Most of the chapters are inadequate; much of the treatment advised is empirical and not based on any physiologic knowledge or thinking, and much is outdated. Thus, one finds under treatment of cholecystitis "A useful routine measure is to give 5 to 10 minims of belladonna to dilate the bile passages and 10 grains of salicylate of soda to dilute the bile, together with 10 grains of hexamine as an antiseptic, and 20 grains of bicarbonate of soda to prevent urinary irritation." Granting that any of these drugs could accomplish any of these things, which is extremely doubtful, how could the changes effected influence a disease which is usually deep in the wall of a gallbladder which commonly has no bile going in or out of it? Still more astounding is the recommendation that antiphlogistine be applied over the gallbladder! Turning to the extremely inadequate section on gastroenterostomy one is astounded to learn that "many neuroses are frequent sequels to the operation. . . ." "Pernicious anemia has occurred too often to be explained as a mere coincidence!" Evidently the writer had a dim recollection of Hartman's 1 case of hyperchromic anemia following resection of a stomach. Certainly it would seem that those who propose to teach ought to be somewhat up to date and fairly well informed.

Principles of Orthodontics. By J. A. Salzmann, D.D.S., Head Dental Service, New York City Vocational Schools, New York. Fabrikoid. Price, $10. Pp. 674, with 450 illustrations. Philadelphia, Montreal & London: J. B. Lippincott Company, 1943.

To the orthodontist this book is disappointing as so little space is devoted to the science and practice of orthodontia and so much to preliminary topics of growth and development of bone, muscle, dentition and tooth eruption. Endocrine function and dysfunction, nutrition and diet have a relationship to dentofacial deformities, though they may be hereditary, environmental or acquired through illness and sometimes accentuated through habits.

Classification and diagnosis of dentofacial anomalies are determined according to different standards. Angle, Simon and Hellman reach their conclusions, determining the deviations from the normal standard, by different methods, which are described in detail. Pont has compiled a table of arch widths based on teeth widths. Thus by the use of the Pont normal tooth index the approximate amount of change required in the arch may be mathematically computed.

In addition to corrective orthodontic appliances, exercises are often prescribed to aid muscular development in forming a better facial contour. Schwarz classifies orthodontic pressure in four degrees, giving results under each degree, with warnings of resulting injury under too great stress. After orthodontic correction is completed retention is but "a leveling off of what we have been doing during treatment. . . . Orban advocates that retention appliances should be worn until the internal transformation of the static jaw structure and the soft tissues is completed."

A complete bibliography makes this book valuable to the student as a reference guide.

Cancer of the Uterus. By Elizabeth Hurdon, C.B.E., M.D. Cloth. Price, $5. Pp. 188, with 29 illustrations. New York & London: Oxford University Press, 1942.

This book deals with cancer of the uterus. The author, Elizabeth Hurdon, was preeminently fitted for writing it, a task which occupied the last two years of her life. Prior to her death in January 1941 Dr. Hurdon entrusted the manuscript to the hands of her associates Drs. Martindale and Russ, who completed it for publication. The sixteen chapters deal with all phases of the subject, including incidence, etiology, pathology, diagnosis, prevention, treatment, complications and results. The clinical and pathologic material of the Marie Curie Hospital of London forms the basis of this treatise. An analysis of the hereditary histories of patients with uterine cancer at the Marie Curie Hospital was inconclusive. The author states that radiotherapy to a great extent has now replaced the surgical treatment of cancer of the cervix and she quotes statistics from the world literature on this point. There is a comprehensive discussion on the principles, technic, complications and results of radiotherapy of cancer of the cervix. Of 836 patients with cancer of the cervix given radiotherapy in the Marie Curie Hospital in London, 36.2 per cent were free of disease at the end of five years. The five year cures were 80 per cent in stage 1, 61.5 per cent in stage 2, 31.4 per cent in stage 3 and 7.2 per cent in stage 4. The radiation treatment of cancer of the cervical stump is discussed, also the surgical and radiation treatment of cancer of the body of the uterus. Cancer of the vagina, cancer of the vulva and the treatment of uterine hemorrhage in nonmalignant disease are discussed in the last three chapters. This is an excellent book. The presentation is sound and correct. It is a highly practical and important contribution to the literature on cancer of the uterus and is recommended as a useful guide to all who are interested in this subject.

Lehrbuch der allgemeinen Kinderpsychiatrie einschliesslich der allgemeinen Psychiatrie der Pubertät und Adoleszenz. Von M. Tramer, Dr. med. et phil., Priv.-Doz. der Universität Bern. Paper. Price, 26 Swiss francs. Pp. 485. Basel: Benno Schwabe & Co. Verlag, 1942.

This is a comprehensive textbook on child psychiatry. The author is a Swiss psychiatrist. He makes it clear that child psychiatry must not be narrowly conceived of as pertaining mainly to major mental illnesses but includes the study of all manner of difficulties, inhibitions and disturbances in psychologic development of the child. He characterizes his point of view as an anthropobiologic one, stemming from the teachings of von Monakow and akin to the psychobiologic approach of Adolph Meyer with its emphasis on envisaging the child "as a whole."

The author presents an orienting survey of the various psychologic approaches to the mental life of the child and discusses "normal" physical and psychologic development. Investigative methods are outlined briefly. In his approach to general psychopathology, a developmental point of view is consistently maintained with emphasis on deviation in tempo of

development and in structure. Individual developmental deviations are presented in extenso under such categories as instinct, drive, feeding, intelligence, will, character and temperament. Individual disturbances and illnesses are classified as somatic, somatopsychic, psychosomatic and psychic. Somatopsychic disturbances (e. g. syphilis and other nervous system involvements) are those in which the somatic factor is the prominent or determining one. The term psychosomatic is used in a narrower sense than in America, primarily referring to psychoneuroses with physical symptomatology. In an appendix 25 illustrative clinical cases are presented.

This comprehensive work has much to recommend it. The attempt to envisage disturbances in childhood in relation to normal processes of growth and development is sound. A real attempt is made to evaluate and give proper emphasis to somatic, psychologic, social and other environmental factors in mental health and illness. The book is weak, however, in the intentional neglect of psychologic dynamisms in favor of a descriptive point of view. The author here avoids some controversial issues but fails to give essential insights into many disturbances. Therapy, despite a chapter on forms of therapy, is on the whole rather neglected. The author's method of classification deserves attention. The book as a whole, despite the serious limitations noted, is a distinguished accomplishment and should be available in all medical school libraries.

Your Child: His Family and Friends. By Frances Bruce Strain. Cloth. Price, $2. Pp. 210, with 12 illustrations. New York and London: D. Appleton-Century Company, 1943.

This book, like so many others of recent date, was written for parents of young children. In a light vein the author gives advice and records her own observations on juvenile behavior. As war activities increase, many homes will be affected—the relationship of parents and their children will change. Nursery schools, after-school centers will gain in importance. The author attempts to explain "the mechanisms which govern the child's emotional development, and the conduct of manifestations which often follow when he has suffered faulty guidance" (a rather large order). "Toughness in dress, speech, radio programs and motion pictures are the orders of the day. . . . Every real man must be either tough on the outside and tender within or vice versa. . . . Parents should prepare the child for what he is to expect, whether he goes to church, school, doctor, hospital, dentist or barber. . . . Adults who achieve economic success, marital harmony, social adaptation, personal accomplishment, and those who fail, may find the explanation in the emotional experiences of childhood. Sex education is treated in a chapter on new brothers and sisters. The book contains a lot of good advice.

The Inner Ear Including Otoneurology, Otosurgery, and Problems in Modern Warfare. By Joseph Fischer, M.D., Staff Member, Beth Israel Hospital, Boston, and Louis E. Wolfson, M.D., Instructor in Ear, Nose, and Throat, Tufts Medical School, Boston. Cloth. Price, $5.75. Pp. 421, with 77 illustrations. New York: Grune & Stratton, 1943.

Griffith in 1924, in reviewing the history of vestibular equilibration, pointed out among numerous other things that it was Flourens over a hundred years ago who first demonstrated that excitation of the semicircular canals of the internal ear produced effects similar to some obtained by certain types of cerebellar stimulation. A close connection between function of one part of the inner ear and the cerebellum was thus pointed out and in the succeeding years the nonacoustic function of the inner ear was solidly established. From the time of Flourens until the present a great deal of investigation has been carried out. Bárány through his work in the first ten or fifteen years of the present century excited the imagination particularly of otologists. The number of physiologists and clinicians before and since Bárány's time whose ardent labors produced some understanding of the mechanism of the end organ and its central connections in health and disease are legion. Griffith mentions no less than 1,701 separate references to the literature from 1820 to 1921, and there has been much work done since then. To assess this enormous material properly to choose what is lasting and important and to combine properly the theoretical and the practical have been the task of the authors of this textbook. This they have done remarkably well, and the clinician finds, for the first time perhaps so well done in English, an introduction to a field of great interest and complexity. There is a beginning chapter on clinical anatomy. It is well illustrated and is followed by a dissertation on the general physiology of the static labyrinth, which is followed by a chapter on applied physiology. To avoid confusion the authors have discussed almost every topic twice. In chapters on physiology theoretical considerations are handled and in the portions devoted to functional tests clinical technics and practical aspects are stressed. There follow illuminating discussions of inflammatory diseases of the inner ear and their intracranial complications, as well as more than passing attention to such topics as facial palsy, inflammations of the petrous pyramid, congenital diseases of the inner ear and the neoplasms of this region. The need of otologists for a book of this character has been apparent for a long time. The authors are to be commended for filling this need so well.

Introduction to Psychiatry. By W. Earl Biddle, M.D., Senior Physician, Warren State Hospital, Warren, Pennsylvania, and Mildred van Sickel, B.S., R.N., Instructor of Nurses, Warren State Hospital. With a foreword by William C. Sandy, M.D., Director, Bureau of Mental Health, Pennsylvania Department of Welfare. Cloth. Price, $2.75. Pp. 358, with 38 illustrations. Philadelphia & London: W. B. Saunders Company, 1943.

This work, by the senior physician and the instructor of nurses of a large state hospital, offers an excellent introduction to psychiatry for nurses, nursing attendants and others having to do with the care of mentally ill in institutional settings. It is a very practical work, attempting to make clear just what a nurse or attendant will encounter in a hospital setting. The meaning of the situation to the patient, care of the patient and the handling of special problems, such as destructiveness, suicidal attempt and aggressiveness toward others, are discussed. Psychiatric disorders with illustrative cases are outlined. Chapters on legal considerations and on prevention of mental disorders round out the discussion. The book meets excellently the purpose for which it was written. It is much too elementary and sketchy to be useful to the student of medicine, but the introductory material it offers is sound and could well be required reading for attendants and others who must have contact with patients in mental hospitals. An excellent annotated bibliography is provided. Questions at the end of each chapter are included as a teaching aid.

Laugh at the Lawyer Who Cross-Examines You! A Court Room Antidote. By Charles L. Cusumano, LL.B., of the New York Bar. Cloth. Pp. 375. New York: Old Faithful Publishing Company, 1942.

Many people, according to this author, who admits that he has writing on the brain, prefer a dose of castor oil to an appearance in court as a witness. The oil may be gulped and the results are fairly predictable; the witness may gulp and swallow but is sure of nothing but perhaps a cold sweat. The purpose of this book is to convince potential witnesses that after all an appearance in court need not be a nightmare if proper preparation has been made and if certain fundamental rules are understood and followed. These rules, which are described as rules of experience, are set forth by the author and developed in detail. Some seventy-five pages are devoted to expert witnesses in general, twelve pages of which are concerned with the medical expert. The reviewer has read the book with mixed emotions. There is much in it that can be recommended; its facetious style, however, may not wear well with many readers.

Spectrophotometry in Medicine, Being the Authorized Translation of "Medizinische Spektrophotometrie." By Priv.-Doz. Dr. Ludwig Hellmeyer. Translated by A. Jordan, M.B., B.S., D.Sc., Junior Demonstrator in Chemical Pathology to St. Bartholomew's Hospital, London, and T. L. Tippell. Cloth. Price, $8.75. Pp. 280, with 120 illustrations. London: Adam Hilger, Limited, 1943.

The theory and selected methods of absorption spectrophotometry and their application to studies of whole blood, serum, urine, bile, ascitic fluid and cerebrospinal fluid are discussed in this volume, which presents an excellent survey of work in this field up to 1932. The book is well illustrated with charts and tables detailing quantitative aspects of the absorption spectrums of many naturally occurring pigments in normal and in pathologic conditions. Of particular interest are descriptions of the König-Martens spectrophotometer and the Zeiss Pulfrich step photometer and the discussions of supplementary photographic procedures for spectrophotometry and the earlier photo-

electric spectrophotometric methods of Suhrmann and Kollath and of Warburg and Negelein. In the eleven years since the publication of the original volume, from which this book is a translation, practical quantitative absorption spectrophotometry has become an increasingly important research tool. Many advances have been made possible by the introduction, improvement and increased production of spectrophotometers suitable for use in the ultraviolet and visible regions of the spectrum. Much of this progress is not reflected in the present volume. However, since the intelligent use of a physical method requires familiarity with the principles involved, a knowledge of the scope of prior applications and an appreciation of the practical limitations of the method, this book should prove of value to students and to workers in the field.

The Practice of Refraction. By Sir Stewart Duke-Elder, M.S., D.Sc., M.D., Surgeon-Oculist to H. M. the King. Fourth edition. Fabrikoid. Price, $4.50. Pp. 328, with 183 illustrations. Philadelphia: Blakiston Company, 1943.

This edition of Duke-Elder's popular textbook on refraction was necessitated by the demand, but, as the author says in the preface, "Few changes have been made in this new edition, which retains the essential character of its predecessor, a circumstance rendered imperative owing to the exigencies of military service." For those who do not know the earlier editions, it may be repeated that this is a comparatively short textbook that presents the subject of the correction of defects of the optical system of the eyes and the associated muscles in a practical manner. Theory and mathematics have been eliminated as far as possible and stress has been laid on clinical practice. Consequently it is an ideal book for the student and beginner in ophthalmology, but at the same time it contains the summation of so much clinical experience that the trained ophthalmologist can profit materially and enjoyably by a study of these pages, written with the flowing ease of which Duke-Elder is a master.

Textbook of Medicine. By Various Authors. Edited by J. J. Conybeare, M.C., D.M., F.R.C.P., Physician to Guy's Hospital, London. Sixth edition. Fabrikoid. Price, $7.50. Pp. 1,147. Baltimore: William Wood & Company, 1942.

The first edition of this well known British textbook of medicine appeared in 1929. The editor has encountered more than the customary difficulties of compilation because of the wide separation of the contributors because of the war and the rapid progress of development along some lines. The sections on tropical diseases and vitamin deficiency diseases have been entirely rewritten. Other sections have been revised more or less extensively. By a great effort the size of the book has been immaterially changed. This has been facilitated by avoiding almost all references to men or publications. Textbooks such as this are still in wide use by medical students and physicians.

Researches in Clinical Physiology. By Sir Almroth E. Wright, M.D., F.R.S., Director of the Inoculation Department and Principal of the Institute of Pathology and Research, St. Mary's Hospital, London. Researches from the Inoculation Department, St. Mary's Hospital, II. Cloth. Price, 12s. 6d. Pp. 163, with 2 illustrations. London: William Heinemann Medical Books, Ltd., 1943.

This little book contains reprinted articles by Sir Almroth Wright published between the years 1891 and 1905. The papers deal with various subjects such as the pathology and therapeutics of scurvy, problems of the coagulability of the blood, the causation and treatment of thrombosis, and hemophilia. As most of these papers are now mainly of historical interest a detailed review is unnecessary. For the same reason the book will be of limited interest.

Facts for Childless Couples. By E. C. Hamblen, M.D., Associate Professor of Obstetrics and Gynecology, Duke University School of Medicine, Durham, N. C. Cloth. Price, $2. Pp. 103, with 11 illustrations. Springfield, Illinois & Baltimore: Charles C Thomas, 1942.

This is a well written book containing a carefully presented analysis of the factors that may combine to produce sterility. Its contents include a chapter on the general considerations of childlessness, followed by chapters explanatory of the reproductive functions of the husband and wife, on examinations of the husband and wife to determine the cause of childlessness, on what treatments of the husband or wife may be necessary, on the probability of success of such treatments, and a concluding chapter dispelling some popular misconceptions about sterility and about the correction of that condition. The foreword correctly states that the book will be of special value to the childless couple. It can also be read with advantage by physicians to whom childless couples may appeal for help.

Nutrition and Diet in Health and Disease. By James S. McLester, M.D., Professor of Medicine, University of Alabama, Birmingham. Fourth edition. Cloth. Price, $8. Pp. 849, with illustrations. Philadelphia & London: W. B. Saunders Company, 1943.

The speed of intensive research on nutrition is reflected in the new edition of McLester's standard work. It has been necessary to rewrite entirely the chapter on vitamins; the nomenclature is revised, and attention is called to many new products in this field. Much has been added about mineral elements. The food allowances constructed by the Food and Nutrition Board of the National Research Council and a copy of the table are included, and also such activities as the movement for enrichment of flour. Statements are made about dehydration, storage and other modern methods of processing food. A special section has been added on nutrition in the aged and on nutrition in industry. These new sections help to make even better a book which has been recognized among the best in its field.

Handbook of Health for Overseas Service. By George Cheever Shattuck, M.D., and William Jason Mixter, M.D. Second edition. Cloth. Price, $1.25. Pp. 228, with 15 illustrations. Cambridge, Massachusetts: Harvard University Press, 1943.

This handbook is intended for use by people who may be unable to obtain medical advice. It is revised from the first edition. The first edition was financed by the Office of Coordinator of Information and was distributed to those overseas who required it. The present edition is published by the Harvard University Press. The subjects of the chapters are keeping fit, common ailments of worldwide occurrence, the tropics, diseases important in the tropics, biting insects, vermin and snakes, the arctic, surgery, first aid and miscellaneous medical information. An appendix includes instruction regarding packing medical and surgical equipment, and tables of weights and measures. All together this is a most practical and useful little book.

New Aspects of Cheap Food. By Rudolph Keller, D.Sc. Paper. Price, 1s. 6d. Pp. 52. London: Research Books Limited in Association with William Heinemann (Medical Books), Limited, 1943.

This pamphlet is apparently intended to introduce continental ideas of diet and cookery into England. As such it has little interest for the American reader, either professional or lay. Its basis table of food values, in terms of so-called multiples against potatoes, takes into consideration nutritional contributions by price; thus for example white bread, on the basis of its contribution of carbohydrates, protein, fat and calories per ounce, is estimated as 2.9 against potatoes and on the basis of price is equivalent to 0.9 unit of potatoes. The author is a strong supporter of the European school of thought which holds that too much sodium and not enough potassium enters into the diet of the human race.

A Guide to the Prevention of Weight-Lifting Injuries. United States Department of Labor, Division of Labor Standards. Special Bulletin No. 11. Paper. Price, 10 cents. Pp. 20, with illustrations. Washington, D. C.: Supt. of Doc., Government Printing Office, 1943.

The United States Department of Labor has just made available this simple guide. Statistics from three leading industrial states show that sprains, strains and hernias constitute one fourth of industrial accidents. Moreover, about one half of these may be attributed to lifting and carrying weights. The excellent pamphlet discusses the causes and the elimination of the hazard and describes fully safe carrying practice. There are many excellent illustrations.

Facts About Child Health 1943. U. S. Department of Labor, Children's Bureau, Publication 294. Paper. Price, 10 cents. Pp. 16. Washington, D. C.: Supt. of Doc., Government Printing Office, 1943.

This pamphlet is a condensed outline of the work, the policies and the aims of the United States Children's Bureau and as such should be interesting and important reading for every physician, public health worker and informed citizen.

Queries and Minor Notes

THE ANSWERS HERE PUBLISHED HAVE BEEN PREPARED BY COMPETENT AUTHORITIES. THEY DO NOT, HOWEVER, REPRESENT THE OPINIONS OF ANY OFFICIAL BODIES UNLESS SPECIFICALLY STATED IN THE REPLY. ANONYMOUS COMMUNICATIONS AND QUERIES ON POSTAL CARDS WILL NOT BE NOTICED. EVERY LETTER MUST CONTAIN THE WRITER'S NAME AND ADDRESS, BUT THESE WILL BE OMITTED ON REQUEST.

ROENTGEN TREATMENT OF AMENORRHEA AND STERILITY

To the Editor:—**A patient complains of sterility, which has been traced to the presence of anovulatory amenorrhea. Treatment with hormones has been unsuccessful and x-ray treatment has been advised. Kindly let me know the present status of treatment of this type of sterility, in particular by x-rays. I am particularly interested in knowing the approximate number of cases treated to date, the approximate percentage of success taking into account the average period of sterility before treatment was started, and also the incidence of any harmful effect of the treatment on the mother or unborn child.** M.D., New York.

ANSWER.—The immediate results of roentgen treatment of amenorrhea and sterility are excellent. Kaplan (*New York State J. Med.* **39**:1380 [July 15] 1939) treated 142 patients, and menstruation was reestablished in 124. In 52 of these women subsequent pregnancy occurred and in this series 17 women conceived more than once. Forty-four women went to term and delivered 50 normal babies. Five women had abortions. Mazer and Baer (*Am. J. Obst. & Gynec.* **37**:1015 [June] 1939) observed restoration of menstrual function in 59 per cent of 106 cases of amenorrhea treated by low dosage irradiation of the pituitary gland and ovaries. Twenty women gave birth to healthy babies and 4 had abortions. Mazer and Baer reviewed the literature on the statistics of roentgen treatment of amenorrhea and the results in most cases were encouraging. A survey of the literature revealed no ill effects on the offspring following preconception irradiation within the limits of dosage employed in this type of therapy. The usual number of abortions is within the usual average incidence. Even heavy preconception irradiation of human ovaries was found to have no harmful effects on offspring of the first generation. However, as Mazer and Baer remark, the problem of damage to human germ cells by heavy irradiation still lacks the necessary fundamentals for proper solution, but this problem does not apply to the small doses employed in the treatment of menstrual disorders. Nevertheless these authors admit that the margin between a safe and a harmful dose is probably limited.

Not all authors agree on the harmlessness of irradiation of the pituitary gland and ovaries. Greenhill (1937 Year Book of Obstetrics and Gynecology, p. 666) says "The feeling about the use of x-ray treatment to overcome amenorrhea and sterility is somewhat analogous to the sentiment about irradiating the pituitary gland to combat menopausal symptoms. Those who favor x-ray treatment are most enthusiastic about it, but a large proportion of those who do not use this treatment condemn it in no uncertain terms. One thing is true, there is no apparent immediate harm from x-ray treatment in most cases, although sometimes permanent amenorrhea occurs. Whether any remote adverse effects will appear from such treatment is theoretical. Of course, only a skilled roentgenologist should be called in to treat women who want to overcome sterility and amenorrhea." Subsequently Greenhill (1939 Year Book of Obstetrics and Gynecology, p. 402) says "I wish I could be as confident as Kaplan of the innocuousness of radiation therapy to the offspring of women who have been subjected to this form of therapy. The results of roentgen treatment in cases of amenorrhea and sterility are excellent, and as far as we know the treatment of the women is harmless in most instances. However, what may happen to the offspring is not definitely known. While it may be fallacious to reason that what occurs in animals necessarily must take place in human beings, we must nevertheless not disregard animal physiology and pathology. In fruit flies, mice and guinea pigs, abnormalities appear in the offspring after irradiation, but the disturbances usually do not manifest themselves until the third generation, that is, great-grandchildren. Since roentgen therapy has not been used for more than thirty years, we do not know what will happen to the great-grandchildren of women who have received deep x-ray treatment. Perhaps we will find that the animal experimentation dealing with roentgen treatment may be applicable to human beings. It may be found that whereas the children and perhaps even the grandchildren of women who were subjected to x-ray therapy were entirely normal, the subsequent progeny was defective either anatomically or physiologically or both. Numerous authorities believe in the possibility of harm of radiation therapy. Among them are H. J. Muller (the first investigator to discover the harmful effects of irradiation), J. H. Mueller, Timofeef-Ressovsky, Little, Bagg, Martius, Peckham and I. Seth Hirsh. Those interested in this subject should read a short article by J. H. Mueller entitled 'The Use of Radium and Roentgen Rays in Gynecology in the Light of Genetic Radiation Research' (*Schweiz. med. Wchnschr.* **69**:849 [Sept. 23] 1939)."

Since the immediate results of radiation therapy are good and since it has not yet been proved that harm may result to the human offspring, it may be justifiable to apply this therapy to some women who are anxious to have a child. However, the possible theoretical dangers should be explained to both husband and wife and the final decision left to them.

The technic advocated by Kaplan is as follows: Factors used are 200 kilovolts, 4 milliamperes with 0.5 mm. of copper plus 1 mm. of aluminum filter; target distance 30-40 cm. Treatment is directed through anterior and posterior right and left pelvic fields of 9 by 12 to 10 by 15 cm. and to the pituitary area on the skin through a 6 by 8 cm. field. Dose given is 75-100 roentgens per field at weekly intervals for three weeks. The anterior pelvis is treated the first week, the posterior the second and the anterior again on the fourth week. Occasionally a fourth treatment is given. The pituitary is treated at the same session as the anterior pelvis.

The treatment recommended by Mazer and his associates is 135 kilovolts, 5 milliamperes at a distance of 40 cm. with 6 mm. of aluminum filtration through a field of 20 by 20 cm. The rays are directed over the anterior pelvic area. Depending on the thickness of the pelvis, 60 to 90 roentgens is given to the skin. This is repeated at intervals of one week, three times. The total dose reaching the ovaries is about 10 per cent of a full skin erythema. The pituitary gland is treated with the same dosage and factors through a field 3 by 3 cm. simultaneously.

CHRONIC NONSPECIFIC URETHRITIS

To the Editor:—**A single white man aged 34 gives a history without record of venereal diseases or urethral discharge. The Wassermann reaction is negative. He has had sexual contact with one person for several months and has not used a prophylactic. Eight days after and sixteen hours after the last two exposures respectively he noticed a small amount of grayish white mucoid discharge appearing at the external meatus. This did not drip but came almost to a drop when the urethra was stripped manually. The meatus would remain moist and stick to his undergarment. There was no burning, itching or frequency of urination. The urine in the first glass showed shreds and particles; the urine in the second glass showed only a few minute particles and no shreds. Five smears and two cultures were negative for the gonococcus. The prostate was not tender or enlarged. With the exception of a little low back discomfort and a tired, painlike feeling down the inside of the left thigh region later on, there were no other symptoms. He was given four courses of sulfathiazole (20 Gm. for five day periods each time) without any improvement. This was given during the eight month period that the condition has been present. The urethra was irrigated with 1:5,000 acriflavine six times, followed by mild protein silver (5 per cent) instillations into the bladder without any improvement. The patient continues well and does not complain except that this condition, which has now existed eight months and shows no sign of stopping, worries him. Can you tell me where the trouble is? Is this a nonspecific condition? What treatment can I render to clear this up? Can I be sure now that it is not gonorrhea? Why does it continue so long? Alcohol and sexual contact have no effect on it either way.** M.D., New Jersey.

ANSWER.—There is little doubt that the patient is suffering from a nonspecific urethritis. The persistence of infections such as this is almost invariably caused by one of two conditions: there is either a chronic infection of the prostate and seminal vesicles or a stricture of the anterior urethra. The statement was made that the prostate was not tender or enlarged, but what about the microscopic study of the expressed secretion? This, and only this, determines the status of these structures as a possible cause of the original complaint. One should calibrate the urethra carefully, watching for stricture of the anterior urethra; especially is it important to note the caliber of the external urinary meatus, as a congenital stenosis here is commonly the cause of a nonspecific infection in the first place, and it is equally responsible in its becoming chronic.

Obviously the management of such a chronic infection depends on the cause. A careful prostatic and seminal vesicle massage followed by an irrigation once a week and urethral dilation followed by an irrigation on the second week is a successful routine usually in the management of these conditions. If the external urinary meatus will not admit a sound of adequate caliber, a urethral meatotomy should be done as a preliminary procedure. It is well likewise to give short intermittent courses of urinary antiseptics such as sulfathiazole.

GALACTORRHEA AND OBESITY

To the Editor:—A woman aged 27, unmarried and a virgin, has had a milky discharge from both breasts during the past seven years. The details of her case are as follows: At the age of 20 she started training to be a nurse. In the six months after this her weight increased from 127 to 171 pounds (57 to 77 Kg.), where it remained for four years. Her menses, which had been regular and painless but profuse, lasting seven days every twenty-eight days, did not appear for eight months, after which they lasted only three or four days each month and would occasionally be missed for three or four months. During the period of amenorrhea she several times noticed little damp spots on her clothes which appeared to be due to a milky discharge from the nipples. Then she noticed it no more until she was 24, when a milky discharge from the nipples came to be nearly always present, more from the right breast than the left, more in hot weather than in cold, more while she was doing hard work than while she was doing light work. For a time then the right breast was a little larger than the left; they had both become large when her weight increased. The milky discharge has persisted up to the present time. Her weight is now 192 pounds (87 Kg.). The menses now last only two days and are scanty and sometimes absent for one or two months. She has never told any one of her symptom till lately. She is a bright healthy young woman who practices her profession on the staff of a large hospital. She has had no illnesses. Her mental outlook seems normal, but she is a little reserved and says that she has never had a particular boy friend. She supports a widowed mother but has no anxieties. Her obesity is general in distribution and does not suggest any particular endocrine disorder. Her skin is normal. The hair is feminine in type and distribution. The breasts are large and inclined to be pendulous. The areolas are pink, 4 cm. in diameter and without large tubercles. The nipples are small but prominent and there is a discharge like colostrum from each; but only a few drops could be collected by expression. No other abnormality can be discovered on physical examination. An anteverted nulliparous uterus can be palpated by rectum. The external genitalia are normal and the hymen is intact. The blood pressure is 120/85. Diethylstilbestrol in doses of 5 mg. daily has had no effect. M.D., Australia.

ANSWER.—The milky discharge from the breasts, known as galactorrhea, is most likely due to hyperactivity of the anterior pituitary hormone prolactin. In rare cases this may be due to persistent, abnormal stimulation of the breasts but nearly always there is some disturbance in other glands of internal secretion. In this case the galactorrhea is undoubtedly linked with the menstrual disturbance and also with the obesity. First the thyroid function should be studied by repeated basal metabolism tests and blood cholesterol studies. If a thyroid dysfunction is found, it should of course be treated. Then a decided attempt should be made by the patient to reduce her weight. This will mean the development of a strong will power to curtail the amount and character of the food eaten. Since the menses now occur with a fair degree of regularity, even though they are scanty, no treatment need be directed toward it. Thyroid therapy alone may suffice to make the menses more normal and help the patient reduce her weight. In this event the secretion of milk may diminish or cease altogether. If not, an attempt may be made to depress pituitary activity by means of estrogens or androgens. If a sufficient amount of diethylstilbestrol fails to affect the flow of milk, the androgens may be tried. Twenty-five mg. of testosterone propionate may be given intramuscularly three times a week for four weeks or longer. However, if more than 300 mg. of testosterone is given, virilizing effects may appear, such as growth of hair on the chin and upper lip, change in voice and slight enlargement of the clitoris. Furthermore, even if the testosterone propionate brings about relief, its effect will usually be temporary, so that further courses of the androgen will have to be given.

VISCEROPTOSIS

To the Editor:—The symptom complex of congenital visceroptosis is too well known to mention. I have a family as patients in which the daughter, aged 10, has the same physical build as that of her mother. Please give me an opinion as to the advisability of fitting this child with an uplift girdle. M.D., Virginia.

ANSWER.—Inquiries of this nature are evidence of the fact that there are many physicians who still continue to diagnose and treat visceroptosis as a disease in conformity with the conceptions of Glénard (1885) and Stiller (1907). However, as the result of authentic clinical observations and anatomic research in the past thirty years, the profession has become more and more skeptical about the significance of visceroptosis, congenital or acquired, and even entertains serious doubts as to whether such diagnosis has ever been warranted. Such investigations seem to have reached their culmination in the work of Moody, Van Nuys and Chamberlain (THE JOURNAL, Dec. 8, 1923, p. 1924) and of Moody (*J. Anat.* **61**:223 [Jan.] 1927). Draper and Touraine (1932), Alvarez (1931) and others have pointed out that exceptional athletic prowess and the asthenic habitus are not incompatible. Many patients are more comfortable when wearing an abdominal support, especially those who have protuberant abdomens. Such improvement, whether real or apparent, is not so much attributable to elevation of the abdominal organs as to increased intra-abdominal tension and better support for the spinal column. Appliances directed to the treatment of "virginal ptosis" are particularly ineffectual and rarely indicated. An adequate amount of intraperitoneal fat furnishes an effective and permanent support for the viscera. Therefore proper dietary measures should be instituted with this in mind. If the abdominal muscles are flabby or undeveloped, abdominal exercises such as those outlined by Martin (*Surg., Gynec. & Obst.* **15**:150 [Aug.] 1912) usually prove helpful.

ADHERENT SCAR IN FRONT OF TRACHEA

To the Editor:—A woman aged 40 with a history of a thyroidectomy fifteen years ago complains of difficulty in swallowing and of pressure in front of her neck. She shows in the center of her old scar right in front of the trachea a deep funnel shaped scar, which is adherent to the trachea. X-ray examination, bronchoscopy and esophagoscopy reveal no pathologic changes. The patient's symptoms can probably be derived from the deeply situated scar. I intend to remove the scar and separate the adhesions between the skin and the trachea, but what can be done to prevent a recurrent adhesion? M.D., Ohio.

ANSWER.—By all means this scar should be removed, including all the affected skin. If normal skin with subcutaneous fat is brought over the trachea, there is little likelihood of recurrent adhesion.

GLYCOSURIA IN DIABETES

To the Editor:—It seems to me that the answer to the query entitled "Unclassified Glycosuria in Diabetes" (The Journal, July 17, 1943) is inadequate on three counts: 1. A diagnosis of probable diabetes is given on the basis of a dextrose tolerance curve (data in note) which appears to me to indicate a normal much more than a diabetic individual. 2. I consider his discussion of the renal glycosuria overcautious. 3. The suggestions tendered to the physician for confirming or discrediting a diagnosis of diabetes are rather incomplete.

The basic character of the patient's dextrose tolerance curve was a forty-five minute rise from a normal fasting blood sugar to a moderate height which was maintained as a plateau for a period of nearly two hours, whereupon a very sharp descent to a value below the fasting blood sugar occurred. It should be emphasized that, except for the overlong maintenance of a high plateau value, this is an essentially normal curve. The rise was fairly sharp, as was the descent. There was not noticed this long straggling rise to a high blood sugar level with a subsequent very slow but continuous decline to near fasting levels typical of a person with diabetes. The liver, of course, is the important organ in determining the level of the blood sugar; the role of insulin in this organ is not as distinctly understood. The work of Soskin has clearly demonstrated that one of the most fundamental effects of insulin in the liver is that it, in conjunction with the anterior pituitary hormone, establishes a distinct equilibrium point above which sugar is taken from the blood and below which sugar is released to the blood. Insulin may or may not play a role in the systems involved in the attaining of this equilibrium, i. e. the metabolic systems involved in the breakdown or synthesis of glycogen by the liver. It is probable that it does. However, the essential fact is that insulin is the limiting factor in determining the equilibrium point, but there are a number of additional factors which may be involved in the systems which determine the rate of glycogenolysis and its reverse. Therefore the plateau observed is much reduced in significance because there may have been operating factors other than insulin which determined the length of time which was required before normal levels were reached. In this case excessive nervousness incident to the taking of the sample could easily have led to this prolonged plateau. The sharp return to a below normal level has far more significance.

As for the glycosuria, if the patient has the normal fasting blood sugar the data seem to indicate that there can be no question that it is due to either impaired renal function or a normal low renal threshold for sugar. I have seen persons who display renal thresholds to sugar of from 100 mg. to 300 mg. per hundred cubic centimeters. Further indication that the glycosuria is due most probably to a low renal threshold rather than a diabetic blood sugar is the fact that although the patient has had the glycosuria for fifteen years he has been in excellent health during this period.

It seems to me that in view of the indecisive nature of the evidence pointing to diabetes a few simple follow-ups should be made which could go a long way in clearing up the matter. First, the patient's normal blood sugar level under various conditions should be determined. Second, the response of the patient to normal stimuli such as meals should be noted. Also, because of the inconclusive nature of the tolerance test recorded, several more should be made, including the Exton-Rose two dose test. Once the patient's normal blood sugar level has been determined, the question of the renal glycosuria is easily clarified.

Samuel J. Taub, M.D., Chicago.

VACCINE AND SERUM FOR ROCKY MOUNTAIN SPOTTED FEVER

To the Editor:—In Queries and Minor Notes in The Journal, June 12, 1943, page 475, the statement was made, with regard to vaccine for immunization against Rocky Mountain spotted fever, that "one of the biologic laboratories has been licensed to manufacture the egg vaccine but because of press of war work it is doubted that the material is commercially available at this time." The Lederle Laboratories have been distributing both Rocky Mountain Spotted Fever Vaccine (Cox type) and Anti-Rocky Mountain Spotted Fever Serum since May 5, 1942. These products are hence commercially available. Frank C. Comploier, New York.